

No need to compromise—

**WHATEVER THE SIZE-RANGE OR SPECIFICATION,
CYANAMID CAN NOW SUPPLY
A PROCESS FOR EFFICIENT COAL PREPARATION**

Coarse lump, intermediate or fine coal ...metallurgical, steam or home-heating coal . . . whatever the raw coal you must convert to specification fuel, Cyanamid can now supply the preparation process for optimum results at low operating and low capital cost.

No need to compromise. Fit the cleaning process to your coal and its markets. With a process to fit every need and no self-interest in equipment manufacture or plant construction,

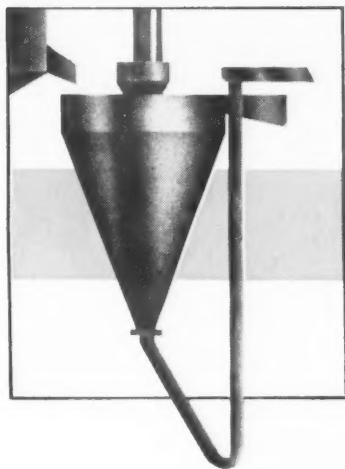
Cyanamid offers unprejudiced counsel based on the results of carload tests of your coal by various preparation processes in the Cyanamid Mineral Dressing Laboratory at Stamford, Connecticut.

We invite discussion and stand ready to run carload tests on your coal; to help engineers of your choice design the most efficient separation unit into your cleaning plant, and to provide the practical assistance of Cyanamid Field Engineers in tuning up the installation.

AMERICAN CYANAMID COMPANY



HEAVY-MEDIA SEPARATION



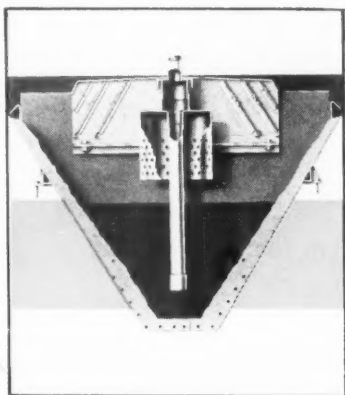
Precision cleaning over a full-size range with inherent advantages over previous preparation methods in cleaning coal with a high-percentage of near-gravity material. Extremely accurate on coal with a high and variable percentage of refuse. Functions efficiently at any desired gravity from 1.25 to 3.40 (within ± 0.01) with gravity quickly and easily adjustable as feed coal changes.

After 1½ years of satisfactory operation, one Heavy-Media Separation plant being relocated and capacity being substantially increased. Two large bituminous plants now nearing completion; a third being designed for the world's largest single-unit metallurgical-coal preparation plant, and an anthracite plant being designed for 1948 operation.



DUTCH STATE MINES CYCLONE

Alone or in conjunction with Heavy-Media Separation, provides amazingly accurate and economical cleaning in the ¼" x 0 range on either anthracite or bituminous. Can be used with autogenous or exogenous medium. Commercial size, continuous-unit "cyclone" for testing carload lots now in operation at the Cyanamid Mineral Dressing Laboratory for determining the applicability of Dutch State Mines techniques to your coal.



FROTH FLOTATION

Low-cost method of preparing anthracite and bituminous in the 28 x 200 size range. Two types available: Steffensen (Free Air) and Fagergren (Mechanical). One plant now in operation on anthracite and a second now under construction. Worthy of study, particularly as a method of profitably recovering fine sizes and simultaneously lessening stream pollution.

30 Rockefeller Plaza, New York 20, N. Y.

Only 5 Main Parts

TAKE WEAR IN ALLIS-CHALMERS SOLIDS PUMPS!

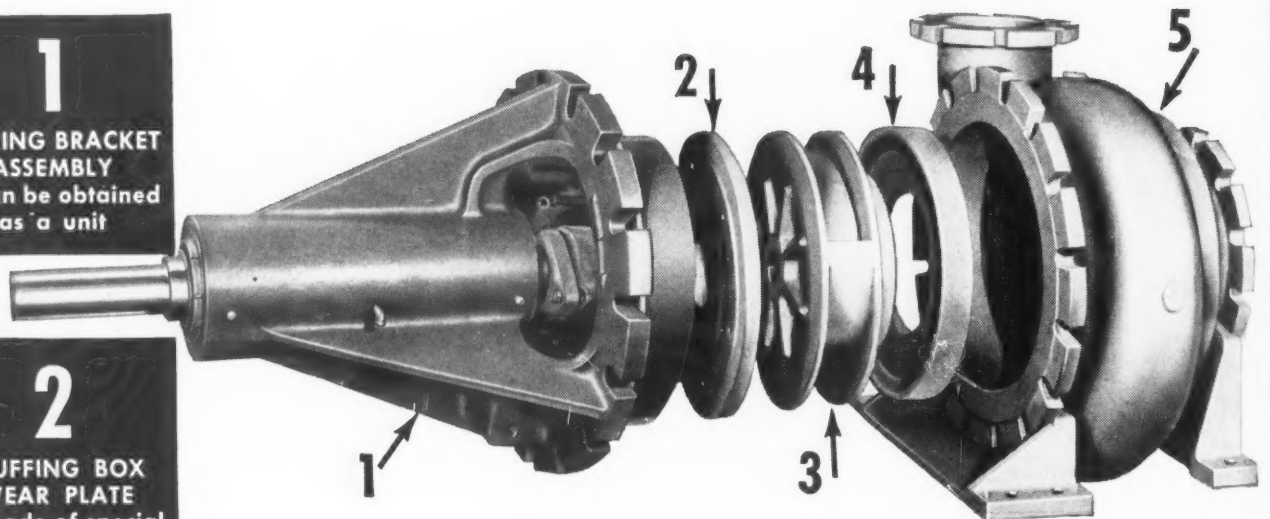
1
BEARING BRACKET ASSEMBLY
— can be obtained as a unit

2
STUFFING BOX WEAR PLATE
— made of special cast alloy

3
IMPELLER — designed to pump slurries of various consistencies

4
SUCTION WEAR PLATE — provides easily maintained clearance

5
CASING — well proportioned with heavy metal thickness

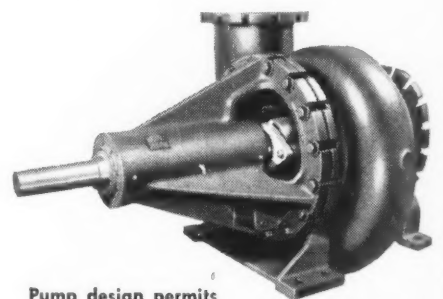


And that means Savings in Time—Low Replacement Parts Cost—Fewer Parts to Stock!

USERS OF ALLIS-CHALMERS Solids Pumps report parts inventory savings up to 70%! Down time slashed as much as 80%! Remarkable results like these are due to the simple design and the special abrasion-resistant alloy construction of these pumps. ➡ All parts are quickly and easily accessible. ➡ Entire rotating assembly can be removed without disturbing the piping arrangement. ➡ Comparable size pumps of different ratings have interchangeable parts.

Allis-Chalmers Solids Pumps are available in 7 sizes ranging from 175 gpm to 7000 gpm. Ask your nearby A-C office or dealer for additional information or write for bulletin 08B6381B. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

A 2343



Pump design permits quick, easy servicing of stuffing box and adjusting of wearing clearances.



ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment—Biggest of All in Range of Industrial Products

Built to take a battering



Thick, rigid steel
for extra strength.

Support here means greater durability. These ties can often be taken up and reused 25 times or more.

Rail base fits here. The two movable clips are easily knocked into place with a hammer.

Mind if we say it once again? *Today's heavier loads require heavier, sturdier ties!*

Bethlehem's No. 5 Tie is built for the battering, bruising service that is now commonplace in mine haulage. Even though you may have purchased thousands of these ties, we suggest you look closely at the picture shown here. It will help to point out once again why the No. 5 is a "bargain buy" under modern, heavy-duty conditions.

Note, first, that thick, rugged section. Note, too, the channel design, which gives added, truss-like support where it is needed most.

The clips are both sturdy and convenient. To install a No. 5, all you do is place the rail base snugly against the stationary clip and tap the revolving clips into place. Do the same with the other rail. There's your tie, completely installed! No spiking, no gaging. No rotting out, for the whole tie is of steel.

Bethlehem's No. 5 is designed specifically for 40-lb


rail. It will handle the full weight of your loaded cars and your heaviest mechanized equipment. Though a bit higher in first cost than the lighter ties, its extra life more than offsets this initial difference. Our representative would like to show you why.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

*On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation*







Coming...fast!

How about you?

The nation-wide coal heating service movement organized by the National Coal Association is making rapid headway. Great progress is being made in helping coal dealers set up complete and continuous service designed to meet—and beat—the service rendered by dealers in competitive fuels and equipment.

If a householder, or any other coal consumer, has trouble with a coal furnace or stoker and can get help quicker and better than he could get if he had an oil burner, that's good. But if it's the other way around—that's *bad*. Coal Heating Service is designed to meet this issue.

*The C & O supports every project
to help coal*

The Chesapeake & Ohio Railway supports every plan, project or movement that will help coal. The C&O contributes heavily to development of better, more efficient, more dependable coal-burning equipment for householders, power plants, industry and railroads.

Above all, every member of the C&O organization is out to help our railroad do the best possible job of getting coal to market from every mine we serve. Second only to coal production is coal transportation. That's our number one responsibility!

Chesapeake & Ohio Railway

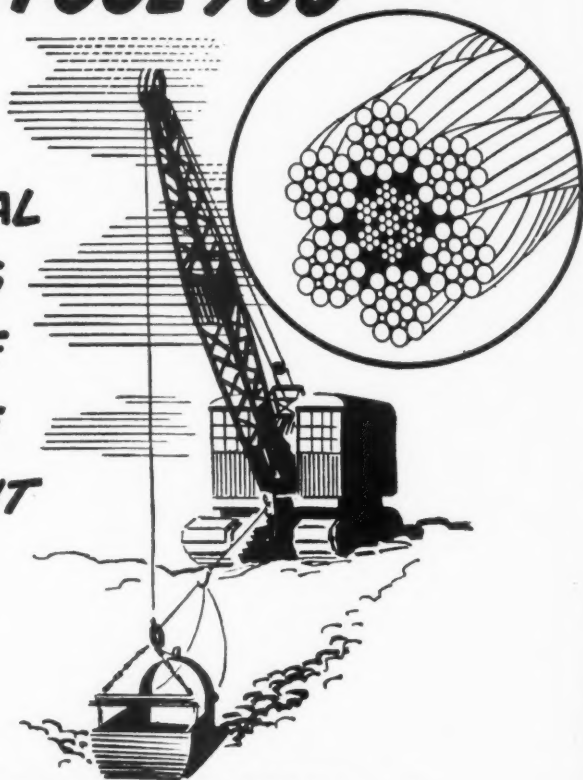
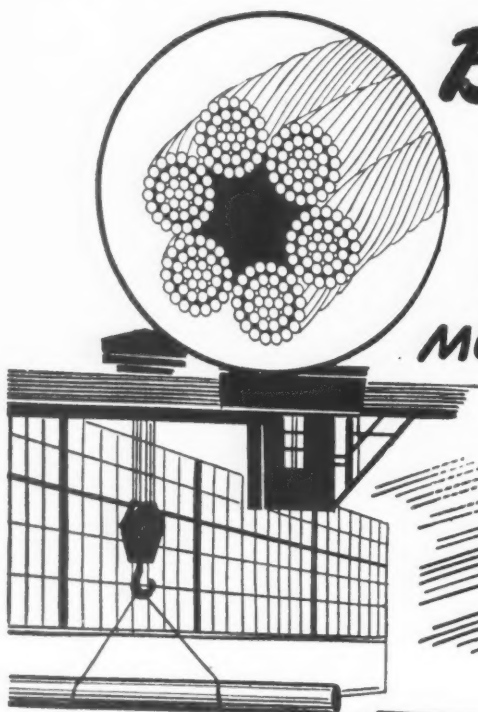
Keep the home fires burning coal

SOME ROPES FOOL YOU

**U-W 6x16 FILLER WIRE IS IDEAL
FOR DRAG CABLES ON DRAG
LINE EXCAVATORS BECAUSE
IT IS SUFFICIENTLY FLEXIBLE
AND ABRASION RESISTANT**

BUT...

**FOR FACTORY CRANES A
MORE FLEXIBLE ROPE IS BETTER
WE RECOMMEND U-W 6x37
CONSTRUCTION FOR
THIS PURPOSE**



**For longest and best service, always specify
U-W LAYRITE (Preformed) IMPROVED PLOW STEEL**

We invite you to let UPSON-WALTON engineer your tough rope jobs.

Copyright 1947—The Upson-Walton Company

THE UPSON-WALTON COMPANY

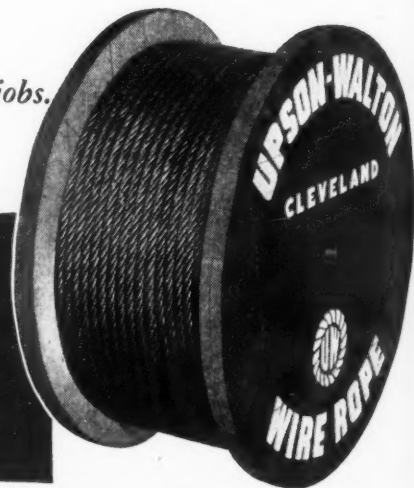
Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks, Brattice Cloth

Main Offices and Factory: Cleveland 13, Ohio

114 Broad Street
New York 4

737 W. Van Buren Street
Chicago 7

241 Oliver Building
Pittsburgh 22

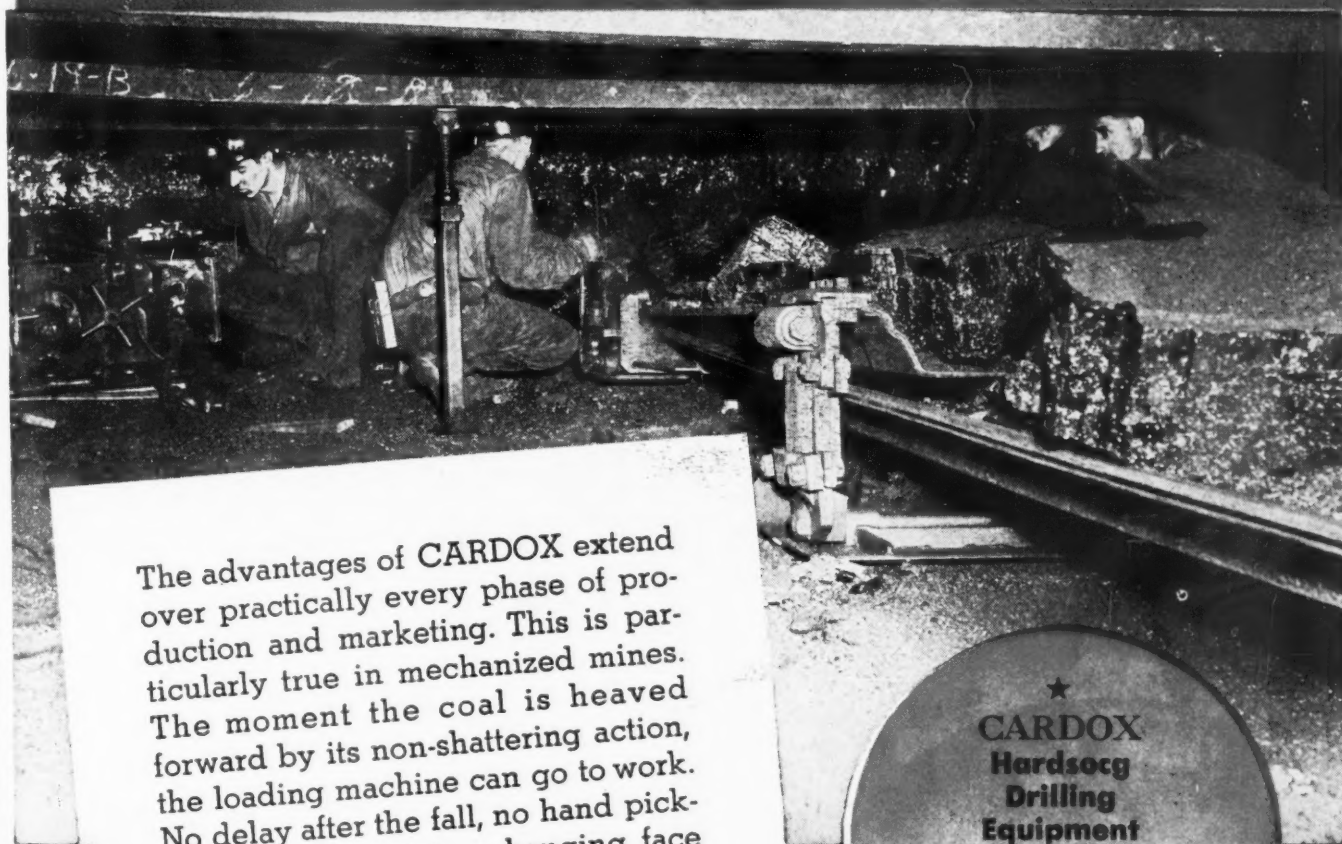


CARDOX

"THE NON-EXPLOSIVE MINING METHOD"

SPEEDS LOADING

—Protects Coal Structure



The advantages of CARDOX extend over practically every phase of production and marketing. This is particularly true in mechanized mines. The moment the coal is heaved forward by its non-shattering action, the loading machine can go to work. No delay after the fall, no hand picking or digging into a hanging face or other production loss. Both timbering costs and cleaning costs are reduced.

Write for full details on free demonstration of CARDOX production economies and marketing advantages.

★
**CARDOX
Hardsocg
Drilling
Equipment**

Complete line of drilling equipment designed to give you the maximum drilling efficiency.



CARDOX CORPORATION • Bell Building • Chicago 1, Illinois

NEW 26-yard stripper plus high-speed . . .

"B" TOURNAPULL... an extra-
capacity rubber-tired earthmover
you can get for '48 delivery!



**See your LeTourneau Distributor for complete
facts on this revolutionary new-type stripper.**

r with unlimited range all-weather performance!

MORE FLOTATION — Extra big 24.00 x 29 tires on the new B Tournapull have tapered beads for lower pressures, more ground contact. Eliminates rim slippage . . . helps rig ride over soft spots . . . travel safely over sticky or slippery grades.

SURE-FOOTED TRACTION — New-type differential automatically supplies 4 times as much power to drive wheel on firmest footing . . . enables Tournapull to walk through deep mud, sand, snow and ice that would stall any ordinary dirtmover.

INSTANTANEOUS SPEED SELECTION — New constant mesh transmission provides instant acceleration . . . enables operator to change gear speeds anytime without loss of momentum or stopping to shift gears — a "must" where going is tough.

POSITIVE POWER STEER — Electric operated gear on yoke king-pin steers Tournapull and Scraper as one integral unit . . . keeps rig rolling in desired direction regardless of conditions underfoot. 90° turning radius increases safety and maneuverability.

FINGER-TIP ELECTRIC CONTROL — All operations are electrically controlled by individual motors, with convenient finger-tip control from dashboard. Reduces operator fatigue . . . makes entire operation safer, easier to control accurately — especially in bad weather.

DEPENDABLE POWER AND BRAKING — Husky 225 h.p. diesel engine provides ample power to pull through the toughest kind of going. Quick, non-swerving stops assured by big, multiple-disc air-brakes on all four wheels.

Tournapull—Trademark Reg. U.S. Pat. Off. ©8m



LETOURNEAU PEORIA, ILLINOIS **EXTRA-CAPACITY** **TOURNAPULLS**

The **SIDES** of a V-BELT

are what **GRIP** the **PULLEY**

-Naturally, it's the **SIDES**
that **GET** the **WEAR**

The story of what wears out a V-Belt—and how a belt can be built to withstand this wear a longer time — is quickly told. Here are the facts:—

Only the sides of a V-Belt touch the pulley. The sides do all the gripping on the pulley. The sides pick up the load. They transmit that load to the belt as a whole. Then, once again, the sides grip the driven pulley and deliver the power to it. And the sides take all the wear against the sheave-groove wall.

This explains why everyone who works around machines has always noticed that the *sidewall* of the ordinary V-belt is the part that wears out first!

That's Why the Patented CONCAVE SIDE
That REDUCES Wear on Sidewalls is So IMPORTANT

Naturally, since the sidewall is the part that wears out first, anything that prolongs the life of the sidewall will lengthen the life of the belt.

The simple diagrams on the right show exactly why the ordinary, straight-sided V-Belt gets excessive wear along

the middle of the sides. They show also why the Patented Concave Side greatly reduces sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-Belt can possibly give.

The Concave Side is MORE Important NOW Than Ever Before!

Now that Gates **SPECIALIZED** Research has resulted in Super Vulco Ropes capable of carrying much heavier loads—up to 40% *higher horsepower ratings* in some cases—the sidewall of the belt is called upon to do even more work in transmitting these heavier loads to the pulley. Naturally,

with heavier loading on the sidewall, the life-prolonging Concave Side is more important **NOW** than ever before!



THE GATES RUBBER COMPANY, DENVER, U. S. A.
"World's Largest Maker of V-Belts"

GATES VULCO ROPE DRIVES

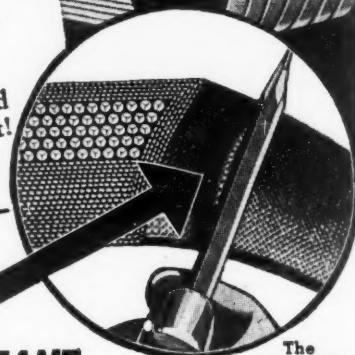
Engineering Offices
and Jobber Stocks

IN ALL INDUSTRIAL CENTERS

of the U. S. and
71 Foreign Countries



Diagram of V-Belt
in Sheave-Groove



The
CONCAVE
SIDE
is a
GATES
PATENT

Straight Sided
V-Belt



How Straight Sided
V-Belt Bulges
When Bending
Around Its Pulley



You can actually feel the bulging of a straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.

Gates V-Belt with
Patented Concave
Sidewall



Showing How Con-
cave Side of Gates V-
Belt Straightens to
Make Perfect Fit in
Sheave Groove When
Belt Is Bending Over
Pulley.



No bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall—and that means much longer life for the belt!

4711

in these *two* spots...



...watch these *five* spots



Hardness Brinell No.	Strength (Ult. Tensile) Lb. Per Sq. In.	Ductility (Elongation) Per. Cent
514	266,000	6
495	247,000	7
401	197,000	9
321	158,000	14
269	133,000	18

Line drawing illustrates how exclusive BP process gives gear tooth graduated hardness. Microphotograph shows microstructure of BP-treated tooth.

You'll get far better performance in your mine locomotive gear drives if you check closely the five points of gear hardness shown in the diagram.

For the diagram shows how the exclusive BP treatment produces a gear which has just the right degree of surface hardness to resist wear, yet is backed up by a tough ductile structure to resist severe shock loads.

The result is a gear hardened specifically for mine locomotive service... with strength, toughness and high resistance to abrasion.

Ask your nearest Westinghouse office for the whole story of BP heat-treated gears and how they contribute to greater operating economy. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-07255



Westinghouse
PLANTS IN 25 CITIES... OFFICES EVERYWHERE

BP Gears

A "Caterpillar" No. 8S Bulldozer, backed by the brute power of its famous team-mate, the "Caterpillar" Diesel D8 Tractor, is one of the most efficient tools ever developed for strip mining operations.

At H. A. Rogers & Sons' mine, near Lebo, Kansas, the big blade is in constant use, taking on a wide range of tough jobs and making them look easy. It clears the land of trees and brush, strips overburden, rough-grades haul-roads, and finally breaks the coal loose for the shovel.

**STRIP MINE
JOBS?
This 'Dozer
does 'em!**

The "Caterpillar" Bulldozer is the biggest advance in scientific blade design in many years. It's rugged, easy and fast to handle, and curved to roll the earth ahead instead of pushing it. Most important of all, the cable-controlled blade is built to work as a smooth-functioning unit with the tractor.

Says owner H. A. Rogers: "This is by far the best 'dozer we have ever used."

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

CATERPILLAR
REG. U. S. PAT. OFF.
DIESEL ENGINES • TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT



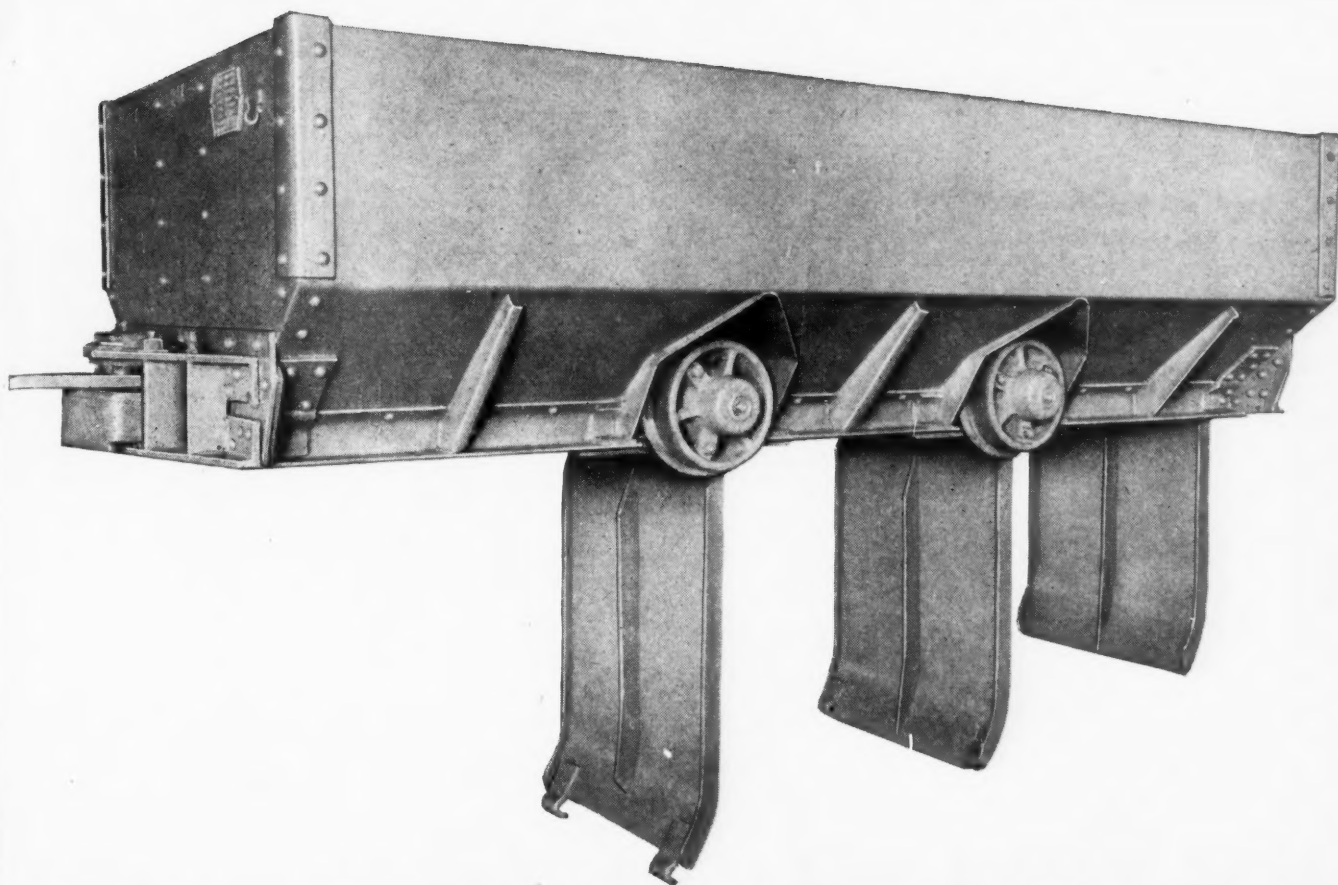
A "Caterpillar" Diesel D8 Tractor with "Caterpillar" No. 8S Bulldozer clears land at H. A. Rogers & Sons' mine, near Lebo, Kansas.



Removing rock and overburden is an easy task for this "Caterpillar" Diesel Tractor-Bulldozer combination.



Breaking out coal after the face has been cleaned. A "Caterpillar" Diesel D4 Tractor with Traxcavator loads trucks.



Its Face is Clean on the Latch End!

Take a look at the car above and notice that its face, on the latch end, is now clean of all unlatching mechanism. This car is our latest and most modern design of 1-2-3 automatic bottom discharge cars. It has our new "Jerk-out" unlatching device that has completely eliminated all outside tripping mechanism. Latch lever bar which formerly extended beyond the side of car, and which had to be raised by hand or some mechanism alongside of the track, has been done away with.

The Automatic "Jerk-out" mechanism, at the bin, unlatches two independently-operated catches from underneath the car. Two latch hooks are provided for maximum safety. A simple provision is made for hand tripping

cars of slate or rock enroute to tipple.

In this new car we have achieved our goal—the coal mine's most perfect mine car. The goal includes, man-less dumping—fool-proof operation—greatest possible capacity for any given overall dimensions—elimination of needless dead weight—smooth running, long lasting trucks—saving in lubrication cost—saving in the cost of electricity used in haulage—maximum reduction of maintaining cars—reduction of coal breakage to the minimum. All of these results have been accomplished by the persisting effort of the engineers of the Sanford-Day Iron Works.

Write us for complete details on these remarkable developments.

20 Car loads of "Automatics" from—



SANFORD-DAY IRON WORKS, Inc. • Knoxville 9, Tenn.



**This \$500,000 picture needs \$4,745 more
... Do you see WHAT'S MISSING?**

These floating derricks valued at \$500,000 can't operate without the wire rope which is missing in the picture. It costs about \$4,745 to equip the derricks with Preformed Wire Rope made of Improved Plow Steel. That's only \$790 more than ordinary wire rope—and Preformed is far more economical.

When you buy any machine rigged with wire rope, make sure it comes equipped with

Preformed. More and more manufacturers are standardizing on Preformed for their original equipment because it improves performance of their products. It's a money-saver because it lasts longer. It's easier and safer to handle.

Write for Free Copy of helpful book about Preformed. Address the Preformed Wire Rope Information Bureau, 520 N. Michigan Avenue, Chicago 11, Illinois.

Ask your own wire rope manufacturer or distributor

**P R E F O R M E D
W I R E R O P E**

**LASTS LONGER
HANDLES EASIER**



Power

Cummins Diesel Power has proven efficient, economical and dependable in a wide variety of jobs . . . under the most grueling operating conditions.



our Policy

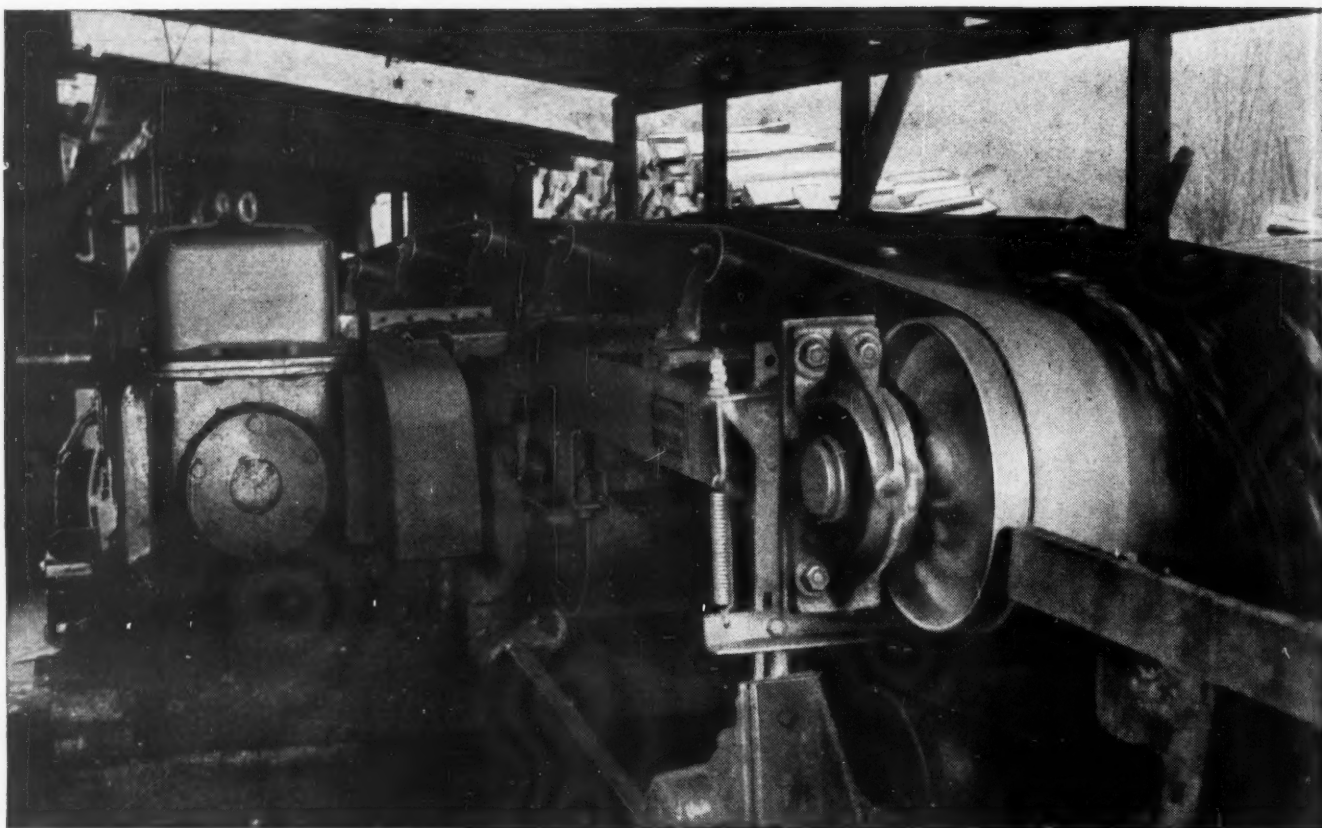
It is Cummins Policy to build the *best diesel* through continuous refinement and improvement . . . to increase horsepower while decreasing weight and space . . . to place quality ahead of quantity.



your Profit

Your investment in power is protected by an unmatched dealer Service-Sales organization with adequate parts stocks, ample service facilities and competent personnel to maintain your engine in peak profit-making condition, no matter where or by whom the engine is sold.

CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA



Here's coal moving out on the double!

We mean coal that is removed from your mine with a Robins Mine Conveyor.

With a Robins, you move out *more* coal . . . and you do it at *less cost per ton!*

You can use a Robins Mine Conveyor level, uphill or downhill . . . with equal efficiency and with equal economy.

You install its sections by simply dropping them into place. Because of this drop-in construction, the Robins Mine Conveyor is able to follow the uneven contour of your mine's floors.

Its low height enables it to follow the seam. It can receive material from any kind of feeding mechanism you employ.

With a Robins Mine Conveyor you'll move coal out on the double. You'll enjoy years of top-notch performance. It is built to take years of hard abuse and never bat an eye.

Ajax Conveyor Belting, made by Hewitt, is the perfect running mate for your Robins Mine Conveyor. Ajax

is a tough, durable belting, specially treated to resist moisture and mildew.

Remember . . . Hewitt-Robins is the *only* company that assumes responsibility for *both* conveyor and belting. It is the only company that can bring you a *complete* conveying system engineered *as a unit* to your exact requirements.

Get the full story of the savings possible in your particular operation. Write *today* to Robins Conveyors Division, Passaic, N. J.

COMPARE THESE EXCLUSIVE ROBINS ADVANTAGES WITH ANY OTHER MINE CONVEYOR

1. **REQUIRES LESS HEAD ROOM.** Only 15" to belt line on intermediate and tail sections.
2. **YOUR CHOICE OF TAKE-UPS.** Tail or intermediate types.
3. **YOUR CHOICE OF WIDTHS.** 26", 30" or 36", in lengths up to 3,000 feet.
4. **YOUR CHOICE OF SECTION LENGTHS.** Either 8- or 10-foot sections, whichever is best suited to your needs. 10-foot length means fewer idlers, less cost.
5. **SIMPLIFIED LUBRICATION.** Equipped with famous Robins Idlers—with exclusive patented One-Shot lubrication. Lubricated from one side only . . . and from either side.
6. **SINGLE RESPONSIBILITY.** One company takes complete responsibility for both elements—conveyor and belting.



ROBINS MINE CONVEYOR

ROBINS CONVEYORS DIVISION
HEWITT-ROBINS INCORPORATED
PASSAIC, NEW JERSEY



GANGWAY FOR A CARGO OF COAL

Another top performance by a **BWH** product

Heavier tonnages, harder strains on equipment... these are problems to be met in all industries as postwar demands for materials increase. Conveyor Belts in particular have to be geared to do a two-fisted job of continuous, heavy-duty operation.

When the problem was to carry heavy loads of coal from ship to shore, a husky BWH Bull Dog Conveyor Belt was installed to do the job. Tough, rugged, depend-

able... built to stand up day in and day out, under grueling punishment... this BWH Belt cut maintenance time and costs, made an outstanding operating record.

Made by the famous BWH ROTOCURE process of continuous vulcanization — which eliminates trouble spots caused by press overlaps, and increases operating life—BWH Belts are continually creating records for durability. So when you want a conveyor belt or

any other industrial rubber goods that can *take it*, look to BWH for dependable ruggedness... and to BWH distributors for dependable service.

• • •

HAVE YOU A JOB WHERE STAMINA COUNTS?

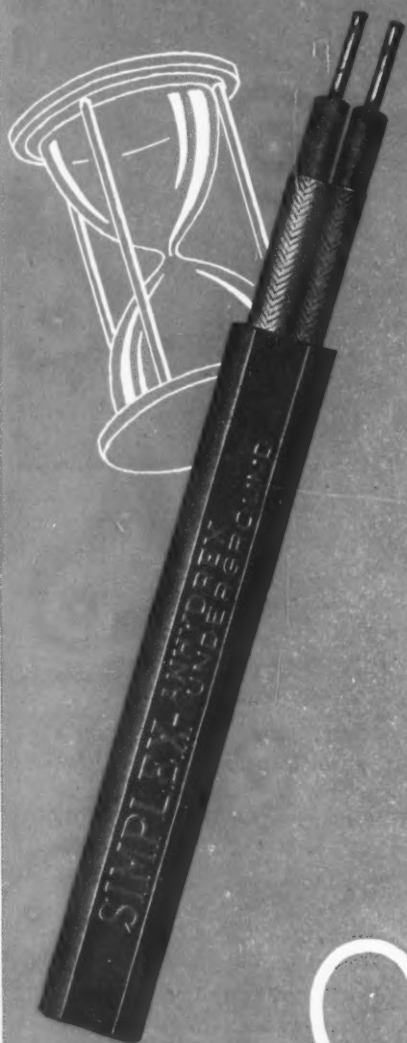
Bring us your toughest problems... we're specialists in solving them. Consult your nearest BWH distributor, or write us direct.


Another Quality Product of
BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all principal cities

PLANT: CAMBRIDGE, MASS., U.S.A. • P.O. BOX 1071, BOSTON 3, MASS.

SAVE TIME...



...use the phone 

A dependable telephone system is one of the best means of increasing safety, keeping up production, preventing mistakes and helping to rectify them when they occur.

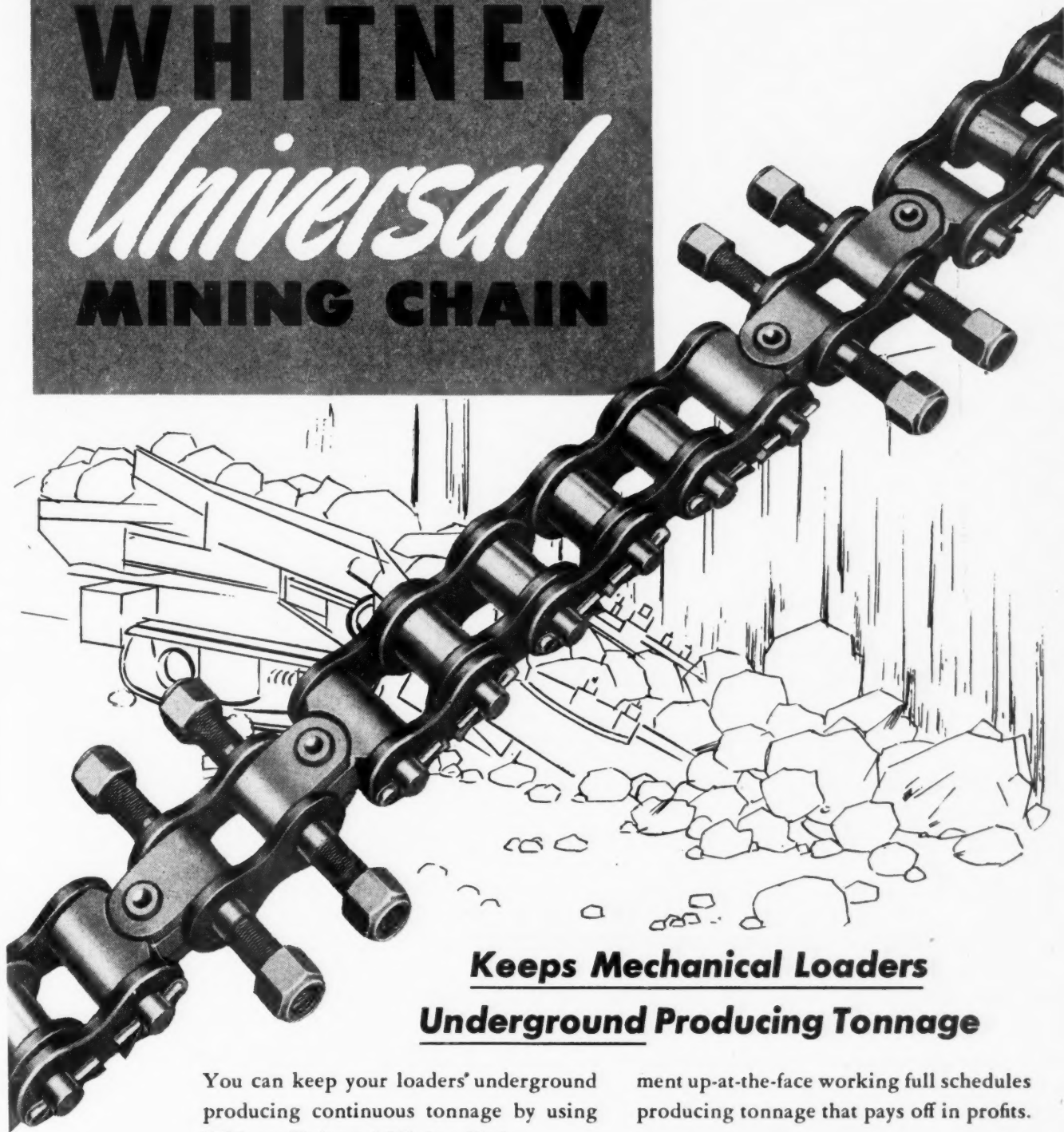
Unless the telephone cable you install has good talking qualities you cannot expect to get the most out of your system. That is why we recommend Simplex-ANHYDREX Mine Telephone Cable.

Simplex-ANHYDREX Mine Telephone Cables have very fine talking qualities and they will take a lot of abuse that ordinary telephone wire won't take. The tough neoprene jacket will resist much of the mechanical abuse that is their lot and the high-grade Simplex-ANHYDREX insulation will preserve the unusually good talking qualities of the cable for a long period of years. The next time you need to install telephone wire consider Simplex-ANHYDREX Mine Telephone Cable.

SIMPLEX WIRES & CABLES

SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.

WHITNEY *Universal* MINING CHAIN



Keeps Mechanical Loaders Underground Producing Tonnage

You can keep your loaders' underground producing continuous tonnage by using Whitney Universal Mining Chain.

This rugged chain has the built-in life to out-perform, out-last ordinary chains. Made of alloy steels, heat-treated for long wearing life, Whitney Universal Mining Chain stands up even under the toughest of operating conditions. It keeps equip-

ment up-at-the-face working full schedules producing tonnage that pays off in profits.

Investigate Whitney Universal Mining Chain for your loaders. They will cut your maintenance costs by giving maximum performance. And for overall drive efficiency, include Whitney cut tooth sprockets in your replacement jobs. Write for complete information.

THE WHITNEY CHAIN & MFG. COMPANY

Your Assurance of Proven Power Transmission and Conveying Since 1896

HARTFORD 2, CONNECTICUT

YOUR CUSTOMER SAYS:



"I want clean coal!"

Your better customers insist on clean, quality coal. If unable to obtain it, they may convert to another type of fuel. It is, therefore, up to the mine operator and coal dealer to provide customers with quality coal, properly

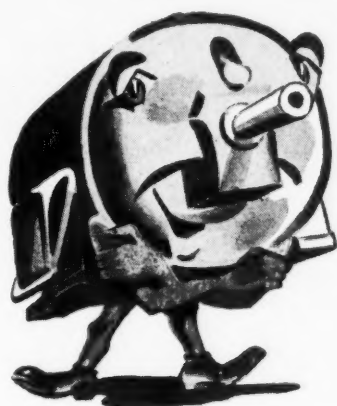
sized and free of dust. Progressive mine operators are treating their coal with Ashland Permatreat Coal Spray which insures a longer lasting dust-proofed fuel and more satisfied customers.



Ask one of our Coal Spray Division representatives to call. There is no obligation.

ASHLAND OIL & REFINING COMPANY
Ashland, Kentucky

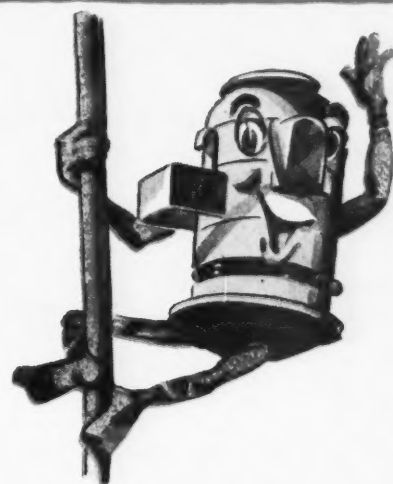
"Which Squirrel-Cage Motor Shall I Buy?"



Open-Type? This general-purpose squirrel-cage motor meets about 9 out of every 10 application requirements; so chances are it's the design you'll select. Allis-Chalmers builds generously proportioned, rugged *open-type* squirrel-cage motors in sizes from 1 hp to the largest practical requirement.



Splash-Proof? Where operating conditions are conducive to entrance of particles or liquids into ordinary motors from either top or sides, Allis-Chalmers *splash-proof* squirrel-cage motors may be your best buy. They're designed to *exclude* top or side directed particles and liquids. Sizes 1 hp to the largest.



Vertical? or Flange-Type? Either can solve a space problem. *Vertical* motors (sizes 1 hp to largest) for vertical drives. *Flange-mounted* for side or angle drives. In both types bearings and closures are designed to prevent grease escapement. Mounting flange for attaching to your base can be provided.

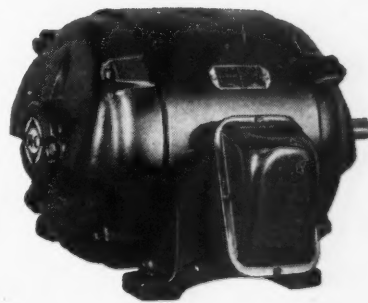


Totally-Enclosed? Explosion-Proof? Completely weather-proof and fan-cooled, these motors are built to beat abrasive dust, dirt and corrosive fumes, or moisture conditions that cause windings in ordinary motors to deteriorate. *Explosion-proof* type for oil refineries, paint, varnish or lacquer plants, etc.; Underwriters approved; reduce hazards in explosive or dust atmospheres. Either type built from 1 hp and up.

Are Motor Decisions More Important Today?

YOU BET THEY ARE! One *obvious* reason is the need for keeping costs down. Another is that in the rush to fill demand much equipment is being misapplied; making it harder to maintain profits not alone today, but tomorrow, the next day and the next year — as long as misapplication continues!

That's why it's important to take a good look at motors — their characteristics — your equipment — power source and surroundings — *before* you buy and apply! If you're in doubt, don't take chances — call a motor expert! **ALLIS-CHALMERS, MILWAUKEE 1, WIS. A 2327**



ALLIS-CHALMERS

**One of the Big 3 in Electric Power Equipment-
Biggest of All in Range of Industrial Products**

ROPES FOR THE BIG STRIPPING JOBS

Before you rerope your dragline machines, why not invite us out for a look? Then, when you ask our recommendations on rope, we'll know your operating conditions. Facts like those are important to the rope engineer; help him do a better job for you.

Pictured below is a giant stripping outfit taking a king-sized bite at a Pennsylvania coal mine. You couldn't tell from the photo, but those big draglines and hoist lines are Bethlehem ropes, and exceptional thought was devoted to grade, size, type, lay, core, and other details. No Bethlehem recommendation is ever made without weighing all factors that can possibly influence rope life and service.

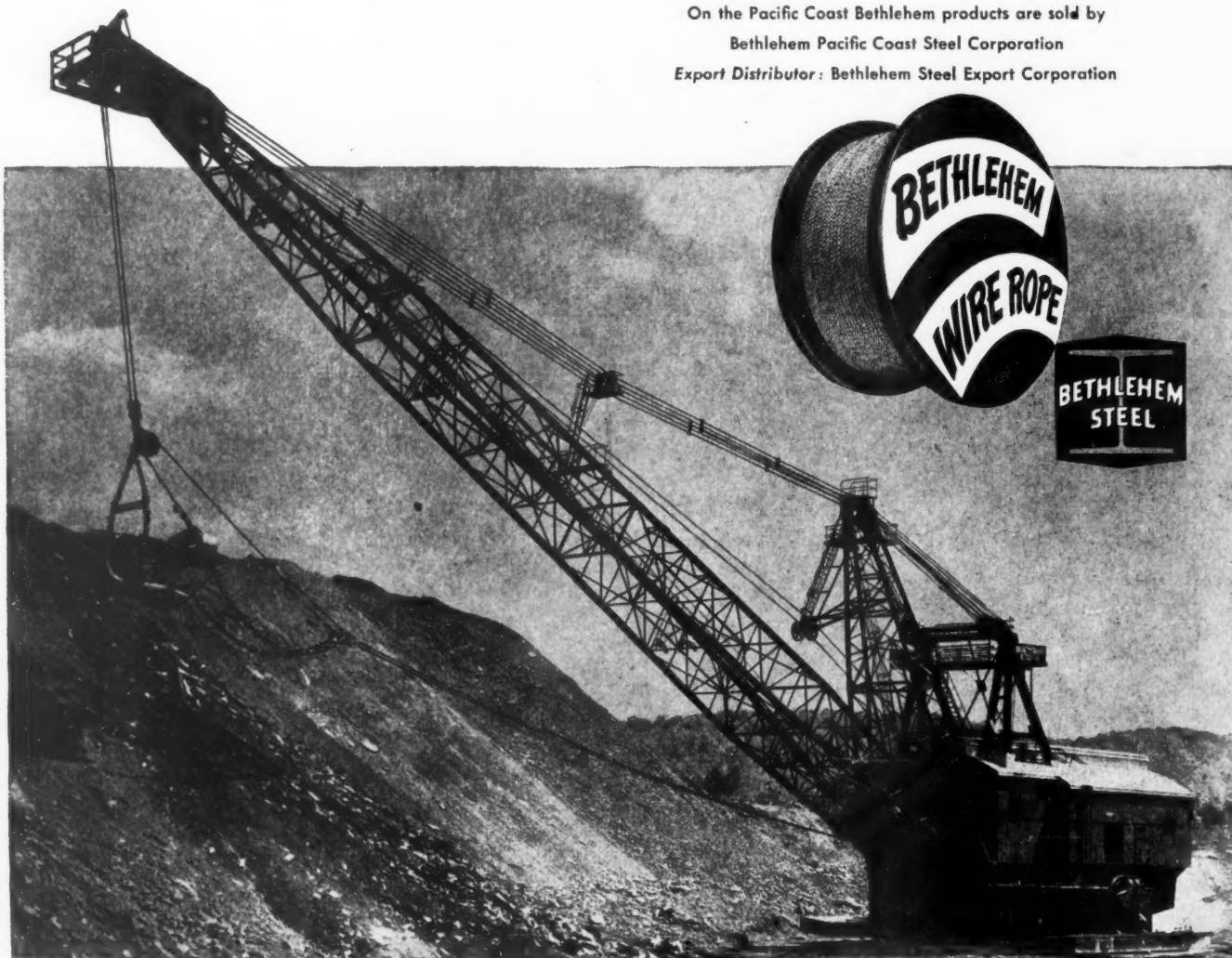
Regardless of what size or make of excavator you own, Bethlehem can equip it with the proper wire rope. It will be good, long-lasting rope, carefully fitted to your needs. Like to talk about it? One of our engineers will be glad to get together with you, at your convenience.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by

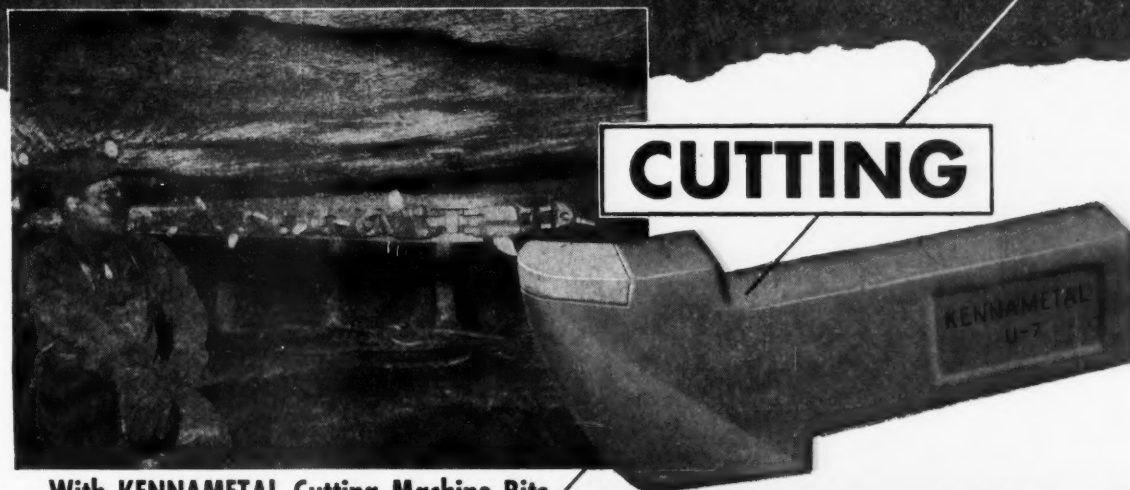
Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation



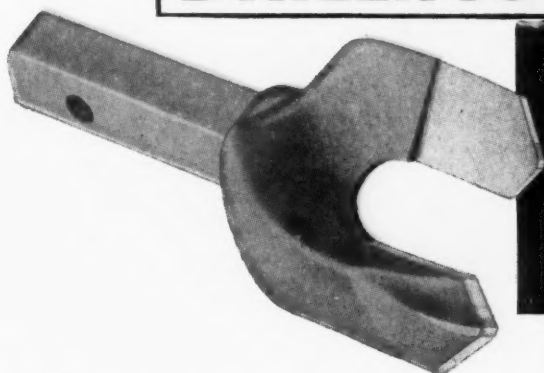
When you think WIRE ROPE... think BETHLEHEM

Fast, Low-Cost



... With KENNAMETAL Cutting Machine Bits

DRILLING



... With KENNAMETAL Blast Hole Drill Bits

It's highly unlikely that you would use mining machines, loaders, locomotives or drills that delay operations and cost a lot to keep on the job. Also it is just as important to use bits that cut and drill faster, wear longer, and cost *less* to keep on the job.

Kennametal bits have a hard, durable, shock-resistant cutting edge that makes them more practical and economical for preparation work than

any other bit yet developed. For example, where steel bits are changed or reset 2 or 3 times per cut, Kennametal cutting machine bits have made 40 cuts or more without being changed, reset, or individually replaced. The time and trouble of making bit changes is reduced to a minimum—the time gained goes into actual cutting and drilling, which contributes to increasing the total output of your mine.



Write for factual performance data "form MM-60" or ask for one of our representatives to call. No obligation.

KENNAMETAL

MINING DIVISION

KENNAMETAL INC., LATROBE, PA., U. S. A.

X-RAY

ON THE LONG LIFE A



TWO COMBINATION OIL SCRAPER AND COMPRESSION RINGS

CHROME-PLATED TOP COMPRESSION RING

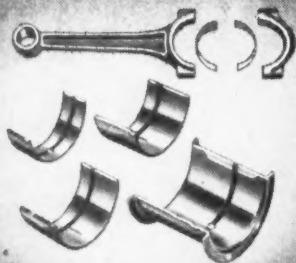
ALUMINUM-ALLOY PISTONS WITH STEEL STRUTS

TOCCO-HARDENED BEARING JOURNALS

WIDE OIL-SEALING RING

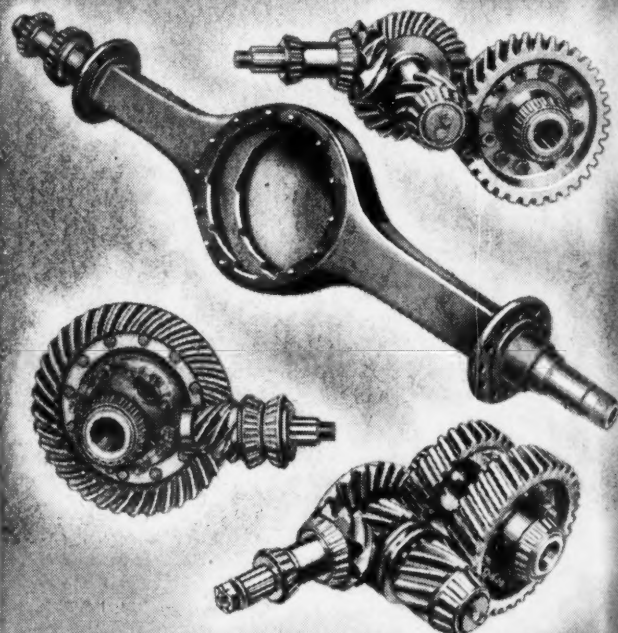
WIDE FACED METAL TIMING GEARS

CRANKSHAFT STATICALLY AND DYNAMICALLY BALANCED



7-bearing crankshaft, with Tocco-hardened journals. Aluminum alloy pistons with four rings. Replaceable multiple-layer bearings.

Rugged, dependable rear axles—single-speed; single-speed, double-reduction, and 2-speed, double-reduction fit every hauling need.



EVIDENCE

AND ECONOMY OF

DODGE "Job-Rated" HEAVY DUTY TRUCKS

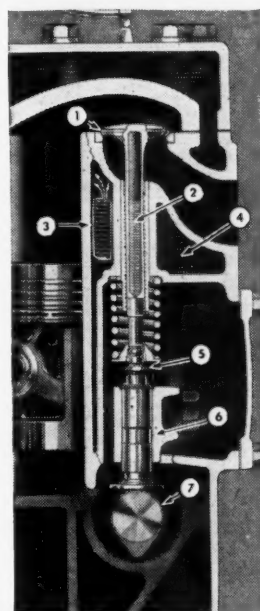
FROM radiator to rear axle, these heavy-duty trucks were especially engineered and built for long, economical service.

They're powered by two brilliant truck engines, of 282 and 331 cubic inch displacement. Horsepower-to-weight ratios reach a new high! These engines develop 225 and 270 pound-feet of torque respectively—and maintain high torque output over a wide speed range.

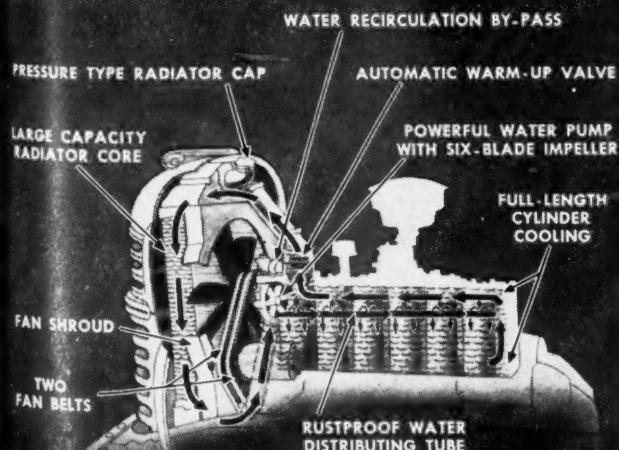
Engine cylinder walls, of chrome nickel molybdenum alloy cast iron, are so hard that wear is almost non-existent. Valves are made of silchrome, a special valve material of exceptional durability. For long life, exhaust valves are sodium-cooled; valves and valve seat inserts are stellite-faced.

Everywhere, unnecessary surplus weight is eliminated by improved design and advanced metallurgy. New and strictly heavy-duty clutches, and a remarkably efficient five-speed transmission—coupled with rear axles of entirely new design—provide a highly efficient transmission of driving torque to the wheels. Despite their husky construction and rugged strength—these trucks handle with ease, even on steep grades with capacity loads.

If your transportation requirements fall within the 18,500 to 23,000-pound gross vehicle weight ranges (up to 40,000 pounds G.T.W.) . . . get the complete story of these great new Dodge "Job-Rated" heavy-duty trucks from your Dodge dealer. We believe you'll find them your long-awaited answer to lower-cost hauling in their capacity ranges!

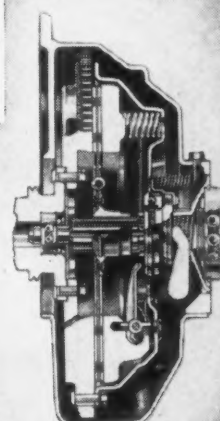
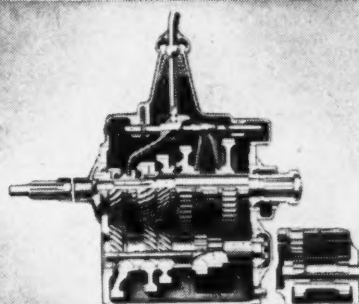


- 1 Stellite-faced exhaust valves and seat inserts. (All valves and valve seat inserts are of hard, durable silchrome.)
- 2 Sodium-cooled exhaust valves.
- 3 Rustproof water distributing tube for exhaust valve seat cooling.
- 4 Large water pockets surround valve stems for quick heat dissipation.
- 5 Self-locking adjusting screws facilitate tappet adjustments.
- 6 Tappets lubricated by pressure feed for long life.
- 7 High-test cast iron alloy camshaft supported by four large bearings.



This highly effective cooling system is an important reason for the greater economy, dependability, and longer life of these heavy-duty trucks.

Rugged 5-speed transmissions and heavy-duty clutches, with capacity well in excess of engine torque, insure long life, low-cost maintenance.



DE LAVAL VERTICAL DRIVE REDUCERS

A complete line of De Laval vertical speed reducers, in both single and double reductions, is available for driving agitators, mixers, and many other types of vertical shaft equipment.

If vertical drives are your problem, consult De Laval.

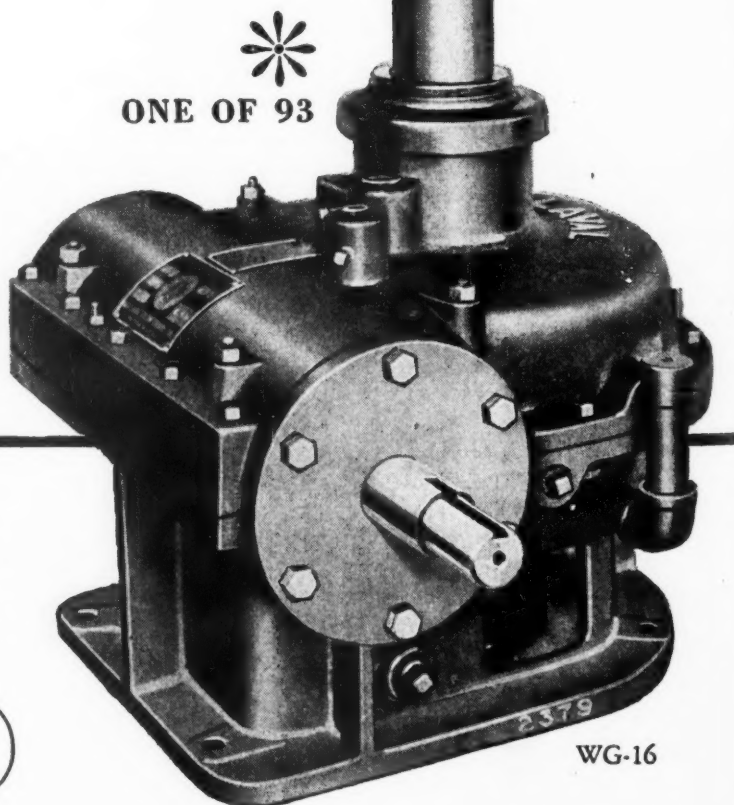
- * This single reduction De Laval Worm Gear Reducer is available with many standard gear ratios and is but one of the 93 sizes of standard De Laval Worm Gear Speed Reducers.

Atlanta • Boston • Charlotte • Chicago • Cleveland
Denver • Detroit • Edmonton • Helena • Houston
Kansas City • Los Angeles • New Orleans • New York
Philadelphia • Pittsburgh • Rochester • St. Paul
Salt Lake City • San Francisco • Seattle • Toronto
Tulsa • Vancouver • Washington, D. C. • Winnipeg

DE LAVAL

Worm Gear Division, De Laval Steam Turbine Company, Trenton 2, New Jersey

TURBINES • HELICAL GEARS • WORM GEAR SPEED REDUCERS • CENTRIFUGAL PUMPS • CENTRIFUGAL BLOWERS AND COMPRESSORS • IMO OIL PUMPS



STEP BY STEP QUALITY

is the result of Process Control
all the way!

Examine a piece of Rome 60 Mining Cable STEP BY STEP and observe its inherent qualities. From inner conductors to outer molded sheath, each process of its manufacture is the result of controlled workmanship.



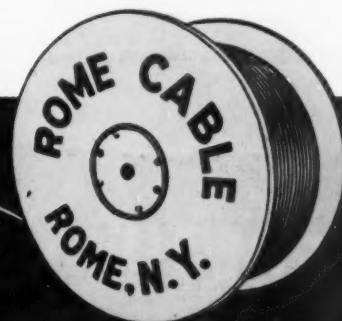
ROME 60
Four-Conductor Power
Cable—Type W.

Designed for hard use in mines under hazardous conditions, toughness plus safety is assured in Rome 60 Cables by careful selection of acceptable materials and process inspection throughout its manufacture. Inspectors, trained in their jobs and with no obligation to production urgencies, watch it ALL THE WAY. You can specify Rome 60 with confidence.

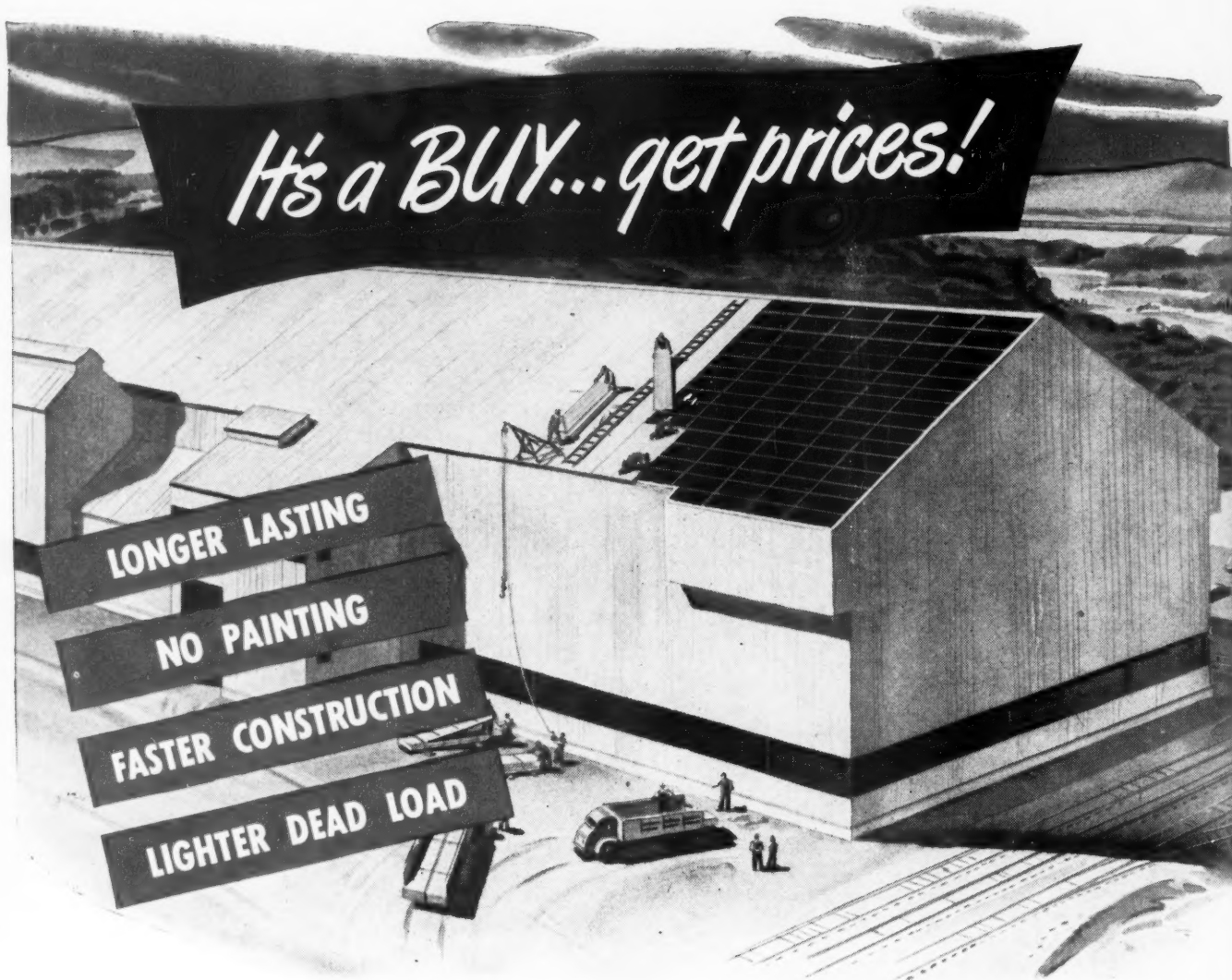
- 1** Precision formed, extra flexible *copper* conductors.
- 2** Uniformly concentric and homogeneous rubber insulation.
- 3** Center filler of specially compounded Neoprene.
- 4** Core completely filled and surrounded with Neoprene.
- 5** Reinforcing braid tightly applied for greater adhesion and durability.
- 6** Molded RoPrene (neoprene) sheath, flame-resistant and dimensionally correct.

FROM BAR TO FINISHED WIRE

ROME CABLE
CORPORATION
ROME • NEW YORK



Alcoa Aluminum INDUSTRIAL R



Here's the answer to your needs for new roofing or siding that can be erected quickly at low cost. Thick, strong, corrugated Alcoa Aluminum. Engineer it now on your future buildings. *Compare Costs!* You're going to save some real money by using Alcoa Industrial Roofing and Siding. It is lower in price than any building material of comparable quality. And you will slash erection costs, too. Light in weight, aluminum goes up easier and faster. No loss from breakage.

The aluminum used in Alcoa Industrial Roofing and Siding is a tough, sturdy Alcoa Alloy that is unexcelled in resistance to atmospheric corrosion by any aluminum alloy now made. Can't rust, streak or stain adjoining surfaces. Withstands smoke and common industrial fumes. Properly engineered and installed, it does not require painting and will give years and years of trouble-free service.

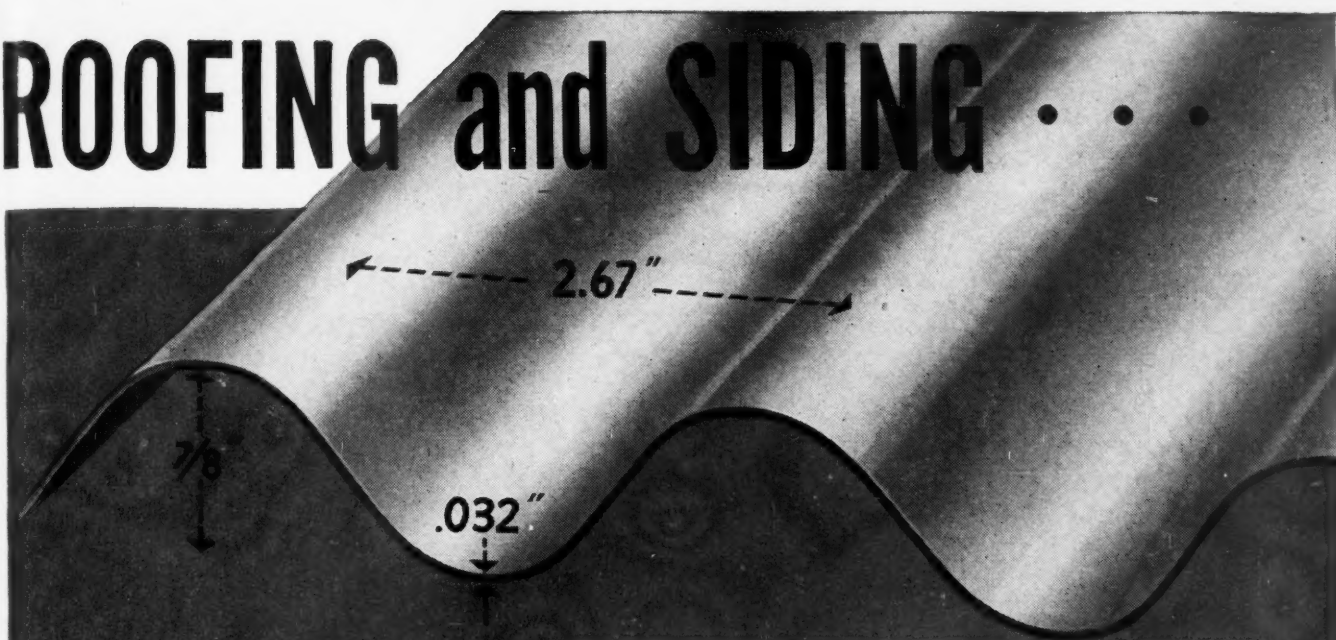
Consult your roofing contractor.

WRITE FOR PRICES



ALCOA

AL ROOFING and SIDING . . .



HERE ARE THE DETAILS

Thickness: .032 inches.

Lengths: 8, 9, 10, 11 and 12 feet.

Widths: Roofing sheet, 35 inches; Siding sheet, 33 3/4 inches; Coverager 32 inches.

Corrugation: 3/8 inch deep, 2.67 inches apart to crown.

Weight: 50 lbs. per 100 sq. ft.

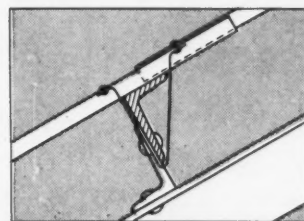
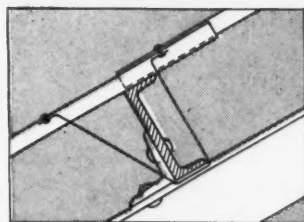
LOAD CARRYING CAPACITY

PURLIN SPACING	CLEAR SPAN	UNIFORM LOAD p.s.f. (Safety factor: 2)
6'6"	76"	29
6'0"	70"	35
5'6"	64"	41
5'0"	58"	50
4'6"	52"	63
4'0"	46"	80

QUICK APPLICATION

Illustrated here are two of the many ways of installing Alcoa Industrial Roofing Sheet.

STRAP FASTENERS CAN BE ADAPTED TO PRACTICALLY ANY TYPE OR ARRANGEMENT OF PURLINS.



WITHSTANDS INDUSTRIAL SMOKE AND FUME



Alcoa Aluminum has been used for many years on coal mines, railroad terminals, warehouses, factory buildings and locomotive roundhouses. The protective qualities of Alcoa Roofing and Siding have been virtually unaffected by these severe conditions.

FOR SIDING THAT GOES UP FAST



Alcoa Industrial Siding has the same corrugation dimensions and lengths as Industrial Roofing. Over-all width is 33 3/4 inches covering 32 inches and providing extra economy for siding applications. Properly applied and with girt spacings up to 7'9" it will withstand 20 p.s.f. wind load.

ASK FOR COMPLETE INFORMATION



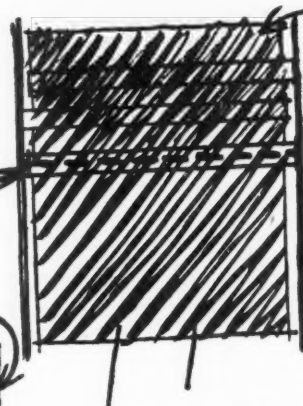
Pick up your telephone now and call your local Alcoa sales office. Ask for a sample and complete information on Alcoa Industrial Roofing and Siding Sheet. Or write to ALUMINUM COMPANY OF AMERICA, 1453 Gulf Bldg., Pittsburgh 19, Pa.

INDUSTRIAL ROOFING AND SIDING

LUBE MEMO

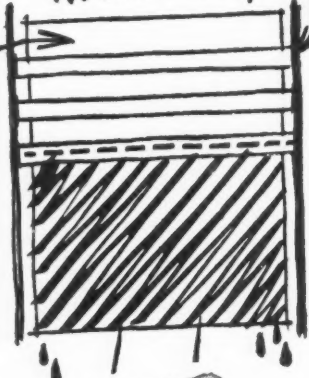
Clogged Oil Ring slots often cause Oil Eaters

Ordinary oil plugs ring slots with gunk



Plugged slots trap oil in combustion chamber where it burns.

No stuck rings



RPM DELO Diesel Engine Lubricating Oil, prevents oil pumping by keeping slots open

RPM DELO Oil is compounded to keep oil ring slots clean 3 ways!

- 1. Resists formation of gum and lacquer.*
- 2. Removes carbon deposits.*
- 3. Holds contaminants in suspension - flushes them out when oil is changed.*

Get RPM DELO Oil at next oil change



DISTRIBUTED BY
Gordon Lubricating Company Transcentral Oil Corporation
 In Pennsylvania, Ohio, West Virginia, Kentucky
 1023 Oliver Bldg., Pittsburgh, Pa. At. 5172
 Andover Road, Columbus, Ohio
 Kingswood 1495

DISTRIBUTED BY
 In Indiana, Illinois, Missouri, Michigan
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 HAR. 2677
 Indianapolis, Ind. Market 1401

you save **3** ways when you buy **GEOPRENE** **P O R T A B L E C A B L E**

COSTS LESS TO BUY

You save up to 20 per cent when you buy a Geoprene Portable cable. You get a smaller-size cable that costs you less but delivers the same power as a larger one.

The key to this saving is higher current-carrying capacity resulting from better insulation and jacket.

The graph, based on 600-volt 2-conductor flat twin cable, shows how 75-C insulation instead of the usual 60-C reduces the cable size needed for any given job and permits a first-cost saving of up to 19 per cent.

COSTS LESS TO HANDLE

You can carry more on a reel because it weighs less, takes less space. For example, a take-up reel on a mine locomotive holding 300 ft of 60-C cable can take up to 425 ft of 75-C cable.

This saving in weight and bulk is particularly true of the larger sizes. For example, a shovel previously requiring a bulky 4/0-awg conductor size can now be served by a 2/0-awg cable.

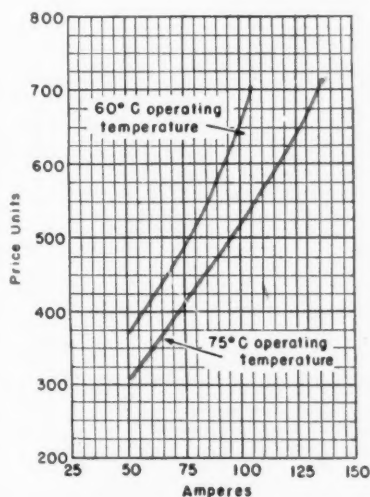
COSTS LESS TO MAINTAIN

Your maintenance costs are lower because Geoprene* hits a new high in strength and chemical stability. In standard tests its tear strength is two and one-half times as high as Tellurium, our famous prewar natural rubber jacket.

This remarkable resistance to cutting action and abrasion boosts the life and safety of Geoprene Portable well beyond that of an ordinary portable cable. In addition, Geoprene shows 105 per cent better aging properties than required by industry specs, and is approved by the state of Pennsylvania for flame resistance.

May we suggest that you remember this longer life at a lower price the next time you need portable cable. For details, call your G-E representative or write for Bulletin GEA-4229, Apparatus Dept., General Electric Co., Schenectady 5, N. Y.

*Geoprene—special G-E compound containing approximately 60 per cent neoprene, with the balance consisting of plasticizers, accelerators, and reinforcing agents.



High-temperature insulation and jacket raise current-carrying capacity, permit use of lower-price, smaller-size cable.

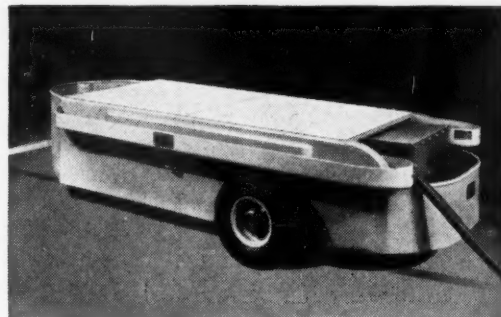
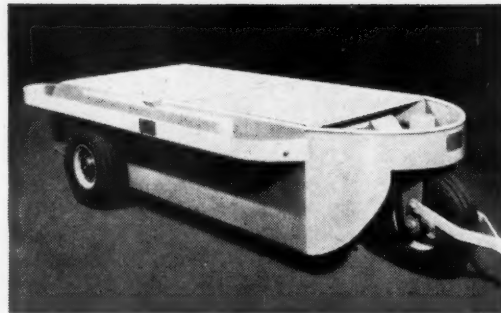
GENERAL ELECTRIC

602-78

HERE'S A NEW CANTRELL COMPRESSOR THAT'S "TAILOR-MADE" FOR TRACKLESS COAL MINING!

Here's our new, improved, more efficient Cantrell "C-2" Compressor for trackless mining or for general use around any mine. The "C-2" is a completely new and modern job of engineering perfection for trackless mining use. From the heavy duty rubber tires to the powerful four cylinder compressor unit, it is sturdy and compact . . . ready to go anywhere and deliver dependable service at all times. Like all Cantrell Compressors, the "C-2" is engineered by men who know the operating problems in mining and what it takes in an air compressor to do a satisfactory job. The Cantrell "C-2" is easier to handle, easier to transport . . . and an all around superior compressor for trackless operations.

Remember we build a compressor for every requirement of track, trackless or stationary use. Write today for information on the complete line of Cantrell Compressors.



Shown Above: Top: Front and side view of the Cantrell "C-2" with safety top in place. Below: Rear and side view of the Cantrell "C-2" showing control box.



CANTRELL "C-2" WITH
SAFETY TOP REMOVED

Cantrell
COMPRESSORS

IMPERIAL-CANTRELL Mfg. Co.
JELLICO TENNESSEE

the vital requirement:

unfailing light

at the working place



dependably provided by **EDISON** ELECTRIC
CAP LAMPS

for over thirty years . . .



The ever-increasing importance of *teamwork* in today's mining puts heavy emphasis on the *dependability* of production equipment, particularly the miner's personal cap lamp.

Light must not fail, for any member of a working group, if full production is to be maintained.

The EDISON Electric Cap Lamp provides unrivalled dependability for the wearer—unfailing, brilliantly effective light at the working place throughout the entire shift—and holds a more than thirty-year record of sterling performance. May we show you in a practical demonstration the reasons-why?

MINE SAFETY APPLIANCES COMPANY

BRADDOCK, THOMAS AND MEADE STREETS PITTSBURGH 8, PA.

District Representatives in Principal Cities

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MINE SAFETY APPLIANCES COMPANY OF CANADA LIMITED

TORONTO . . . MONTREAL . . . CALGARY . . . WINNIPEG . . . VANCOUVER . . . NEW GLASGOW, N.S.

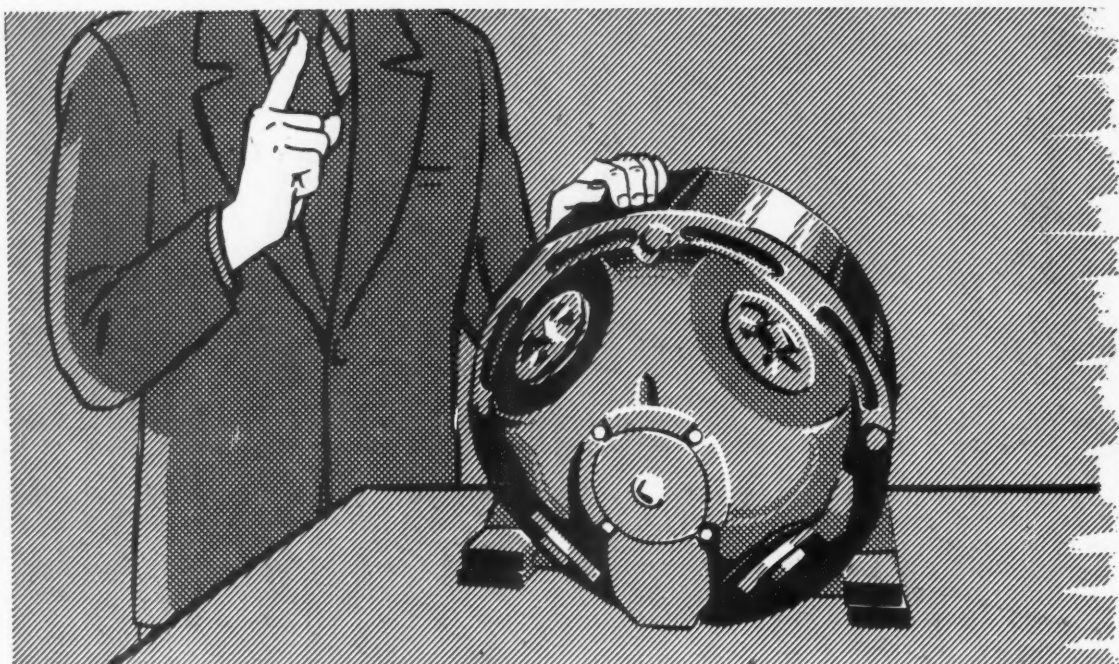
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MINE SAFETY APPLIANCES CO. (S.A.) (PTY) LTD.

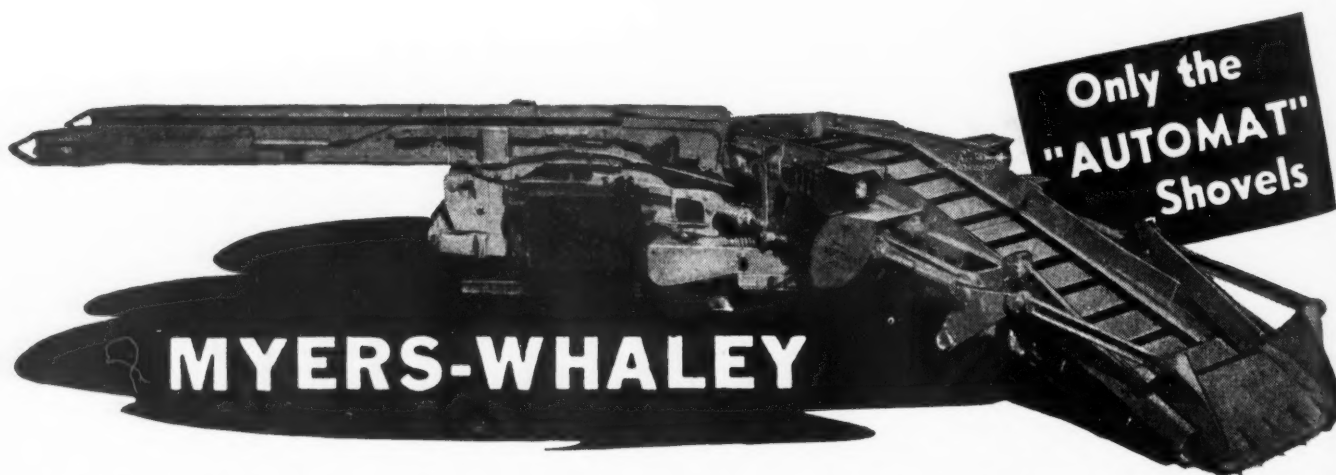
Johannesburg, South Africa N'Dola—Northern Rhodesia





ONLY ONE 25 H. P. MOTOR IS USED TO OPERATE THE WHALEY "AUTOMAT"

The Whaley "Automat" is a smooth running machine. And when you think of it requiring only one 25 H.P. motor for its large capacity, your first thought, naturally, is of low power consumption. With its rated loading capacity of 7 tons a minute and an average loading record of 3 tons a minute this single motor does mean real power savings for all "Automat" users. In fact, only 1/5 K.W.H. per ton of material loaded is required. In addition, the Whaley "Automat" handles coal, rock or slate with equally effective results, loading in its stride any lump of coal that will pass through your tipple or any size rock your cars, aerial tram or larries can take. You'll find other exclusive features that will be of advantage to you, in the Whaley "Automat", all of which add up to safe, all around, dependable loading service. Write for catalog supplement No. 472. Myers-Whaley Company, Knoxville 6, Tennessee.



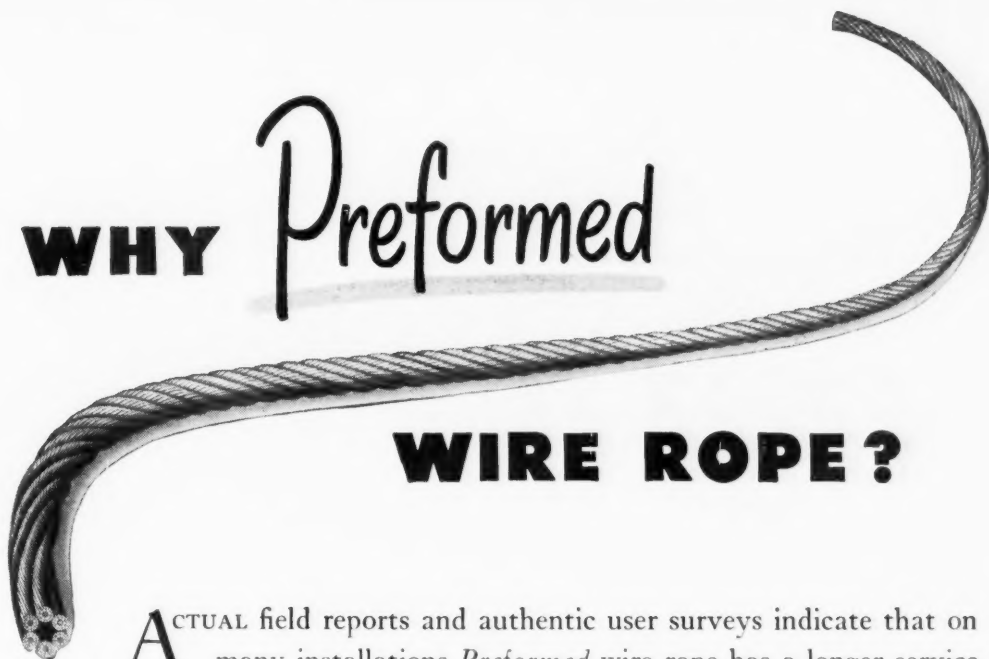
Only the
"AUTOMAT"
Shovels

MYERS-WHALEY

Mechanical Loaders Exclusively for Over 39 Years

WHY *Preformed*

WIRE ROPE?



ACTUAL field reports and authentic user surveys indicate that on many installations *Preformed* wire rope has a longer service life than non-preformed or standard type.

But longer life is but one of the advantages of *Preformed*. A *Preformed* wire rope is also easier and safer to handle. And here's why:

In *Preforming*, the wires and strands are scientifically pre-shaped to the exact helical positions they will assume in the finished rope . . . thus assuring freedom from internal stress.

This freedom from liveliness or twistiness makes your more flexible *Preformed* rope less likely to kink . . . enabling you to rig it more speedily . . . with less time out for repairs and replacements. Furthermore, when your *Preformed* rope becomes worn, broken wires lie flat and in place. They do not unravel, porcupine or protrude jaggedly to damage adjacent lines or injure your workmen.

FOR PREFORMED CONSTRUCTION PLUS UNVARYING QUALITY STANDARDS

U-S-S AMERICAN *Tiger Brand*
Excellay Preformed

As the world's largest supplier of wire rope, we can furnish either Tiger Brand Excellay Preformed or Non-preformed Rope. There are many applications where our Excellay Preformed can improve service . . . where the increased service of Excellay more than pays for the increased cost of Preformed rope. If there is any question, our engineers are at your service. Our aim is to supply the most desirable rope for any service you have. We welcome your inquiries.

IMMEDIATE DELIVERY — All types and sizes

AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

COLUMBIA STEEL COMPANY

San Francisco

*Tennessee Coal, Iron & Railroad Company, Birmingham,
Southern Distributors*

United States Steel Export Company, New York

UNITED STATES STEEL





JOY

LOADERS

SEND RECORDS SOARING...

REDUCE COSTS . . .

INCREASE TONNAGE . . .

OPERATE ECONOMICALLY . . .

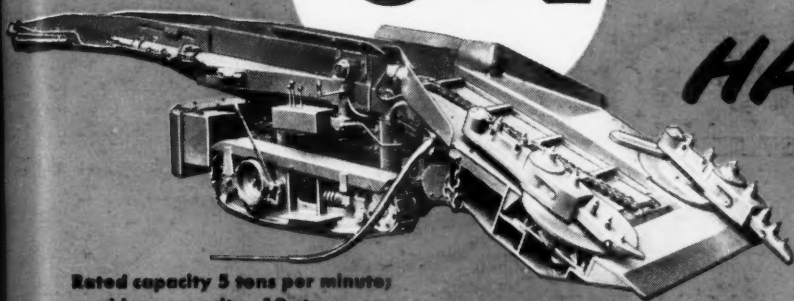
HAVE LOW MAINTENANCE . . .



*Consult a
Joy Engineer*

JOY

11-BU LOADER



Rated capacity 5 tons per minute; machine capacity 10 tons per minute. Sturdily constructed for heavy duty work in seams averaging 60" or more in thickness.

**HANDLES UP TO
10 TONS PER
MINUTE IN
HIGH SEAMS**

JOY

14-BU LOADER

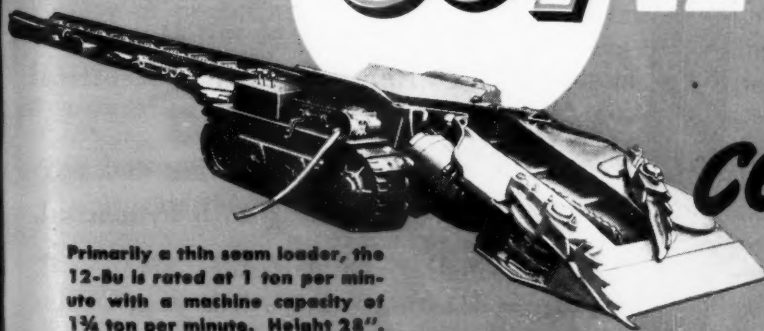


Rated capacity 5 tons per minute; machine capacity 8 tons per minute. Available in 30½", 33" or 36" heights. Individual motors drive gathering arms.

**LOADS AS HIGH AS
8 TONS PER
MINUTE IN
LOW SEAMS**

JOY

12-BU LOADER



Primarily a thin seam loader, the 12-Bu is rated at 1 ton per minute with a machine capacity of 1¼ ton per minute. Height 28".

**IS IDEAL FOR
CONVEYOR MINING**

JOY DIVISION

JOY MANUFACTURING CO.

GENERAL OFFICES: HENRY W. OLIVER BLDG., PITTSBURGH 22, PA.

W&D CL 11



The star in this BIG DIPPER *is...*

Stripping operations start hitting peak efficiency when Primacord paves the way. Each time a giant bucket swings out it sinks its teeth into a full load — there's good digging because Primacord-fired shots have produced well-broken ground.

Primacord shoots an entire hookup from a single cap. With branch lines down the holes contacting every cartridge, every cartridge *goes* with peak explosive power. You hook up branch and trunk lines easily and quickly with

half-hitches and square knots . . . you *plan* for effective shot rotation. Where high voltage equipment is on the job, Primacord is the ideal initiator to use — it's not affected by stray electrical currents.

Keep big equipment moving and paying its way by shooting with Primacord. There's a type suitable for every stripping or blasting need. Ask your explosives company — or write us direct. P-78

THE ENSIGN-BICKFORD CO., SIMSBURY, CONN.
Also Ensign-Bickford *Safety Fuse* • Since 1836

NOVEMBER, 1947

IVAN A. GIVEN, EDITOR

Added Power

MARKING 30 years of service to the bituminous industry, the meeting of the National Coal Association in Chicago Oct. 16-18 again provided a bench mark for measuring progress and a new starting point in sharpening plans for solving the several real problems that still confront the industry. These problems range from government subsidy of competition to profitable utilization of stripped land. They include safety, labor relations, taxes, federal legislation and regulations in the wage-and-hour, labor-relations and other fields, providing necessary exports while still meeting heavy internal demands, insuring an adequate supply of trained men for manning the mines, making research work for coal, keeping the big locomotive-fuel market, winning and holding the domestic consumer, and building public and employee goodwill by making the facts about coal mining known.

The proceedings at Chicago brought out the fact that real progress has been made. They also brought out the equally important fact that that progress still is short of the goal and, in some instances, is short of that expected in the past year or so for various reasons, including the difficulty of producing enough to meet all demands at all times. Realizing this, and realizing the magnitude of the job ahead, the members of the association moved to reshape the organization to better cope with the problems of the future—and of vital importance—voted a dues increase to provide the funds necessary to carry out the reorganized and enlarged program. Since the additional funds will assure the continuation and expansion of the activities of Coal Heating Service and the Bituminous Coal Institute, as well as other organization activities, particularly in the directions of holding and expanding the domestic market and promoting public and employee respect and regard for coal, this is a move that logically merits the support of every producer in the industry. In fact, there is real truth in statements by a number of producers that an even

greater increase in dues would have been desirable because of the extra benefits it would have provided.

While coal has gone a long way along the road to better service to the public, and consequent prosperity for its stockholders, its management and its employees—and will go ahead even faster as a result of the steps taken at Chicago—progress is not something that can be left to association activities alone. It is, as was repeatedly brought out at Chicago, a matter for each operator and each man in the industry as well. By working in his own community, and among his own employees and customers, each operator and each management man can greatly extend the work of the national organization and thus reach the industry's goal that much quicker. Coal's opportunity is now the best in many, many years. Company and personal work to support and supplement the national will enable coal to cash in to the fullest immediately.

Efficiency Ingredients

WITH A GOOD START on the installation of mechanical-mining equipment, coal is moving into a new production phase: concentration on getting the most out of the equipment, with consequent increase in tons per man and reduction in cost—the major ingredient in competitive power. More and more, study is being broadened to include crew size and more efficient service to the loading unit. Fundamentally adjustments are being made on the principle that men should be added to the crew and auxiliary units to the service equipment until the curve of tons per man stops going up. Therefore if, as lately reported by a number of operators, putting a third shuttle car behind a loader or adding men to the crew results in an increase in output per man, there should be no hesitancy in doing so. Experience shows that it pays off—not only in greater tons per man but in a higher yield per dollar of investment in the loading equipment.

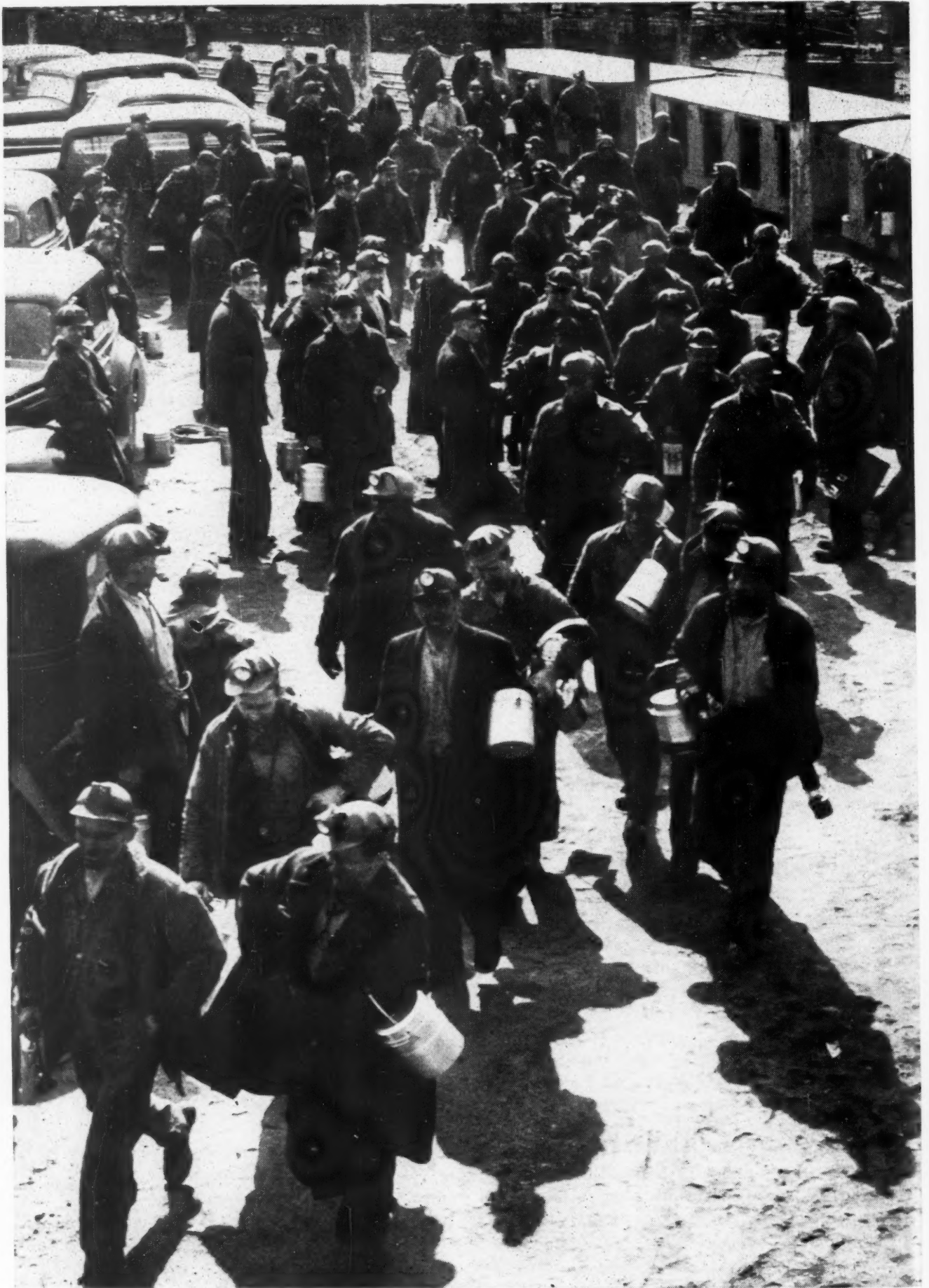
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AL AGE

THE COMPANY PUBLICATION—MINER-MANAGEMENT BOND



THE MINER, HIS FELLOW WORKERS, his company and the coal industry are interest-getting topics for the coal-company magazine, which has as its goal better relations between the company and its employees.



CATCHY NAMES and dressed-up mastheads, with bright color splashes, boost initial interest and send readers off to a good start.

Selling the Coal Miner

**Attention - Catching Publications Using the Human Approach Build Confidence in the Company and Show How the Miner Can Help Coal Improve Its Position—
How They Are Produced and What They Cost**

GETTING MINERS to think of their company in terms of "we" instead of "they" is a long step forward in winning their cooperation

and building better labor relations. Fundamentally, it is a job in communications — keeping them informed about what their company

is doing, where it stands, what it plans and how they share in its tasks and gains.

To carry their message to miners and create a feeling of partnership, a good many coal-producing companies are investing talent, along with considerable sums of money, in company publications — magazines, news sheets and safety bulletins. These publications range in size from four to 24 pages. They vary from mimeographed sheets stapled together to elaborate print-



STAFF WORK makes the publication. For the Lorain-Lorado Journal, Mrs. C. B. Gairing (left) reports for eastern Ohio and Mrs. T. G. Accord (right) for mines at Lorado, W. Va. Harry Walter (center), editor, with Mrs. B. Kwatkowski, production assistant.

ing jobs splashed with color and filled with pictures. But whatever their size, cost or makeup, they all shoot for the same goal: a working force of miners who feel secure about their jobs and are proud of their company, who work with others to keep the business going and whose outlook is broader than the horizons of their own jobs.

How do these publications go about their jobs? What do they print? How do they attract wide reader interest? What do they cost? What assures their success?

Staff Set-Ups Differ

Putting together the coal-company publication is anything from a spare-time job for one man—personnel, public relations or safety director—to a major responsibility for a large staff under an editorial expert. Among the larger magazines, for example, the *Lorain-Lorado Journal*, published by the Lorain Coal & Dock Co. and the Lorado Coal Mining Co., Columbus, Ohio, is the task of the personnel department. As the month's deadline nears, material for the magazine flows in from volunteer correspondents scattered among the company's operations and is transcribed in the personnel office. Meanwhile, other material, designed for feature articles and scheduled for as much as six to 12 months in advance, takes shape in the central office. When the copy is all gathered and the art work done, an expert is called in to help rewrite and fit the magazine together and to work in close liaison with the printer. About 1,600 copies are printed, 1,200 of which are handed out by the payroll offices on payday. The rest go to customers, schools and universities, other coal companies, servicemen and other interested persons.

The *Hanna Coal News*, published by the Hanna Coal Co., St. Clairsville, Ohio, is one of the several public-relations and promotional jobs of a separate department manned by a chief and his assistant, who spend a great part of their time among miners and their friends, promote picnics, ball games and safety meets and handle general publicity with wire services, the press and magazines. A full-time secretary handles office routine. About 10,000 copies are printed each month, 5,000 of which are mailed to employees and other residents of the area, while the rest are sent out through the Cleveland office to customers and individuals.

Without attempting to review all coal-company publications or any one of them, a survey of some of the best shows a wide range of subjects to draw reader interest, including, in broad outline, the following: the company, the industry at large, the company's customers, national affairs and issues, people, safety and community events.

The Company—Sharing information about the company with miners shows them how running a coal mine is a job for lots of people with different skills. Many publications—the *Check Board* of the Consolidation Coal Co. (Ky.), and the *Safety Commentator* of the Hudson Coal Co., to mention only two—feature frequent word-and-picture articles on such divisions as the legal department, the accounting office, the sales force, the supply warehouse, the company store, the laboratory, the prospecting crew, the lamphouse and the medical staff, in addition to general mining operations.

To show how the company makes better jobs and provides more security for its miners, special stress is laid on new developments that assure the company's future, new machines and equipment to make jobs easier and mine more coal, new buildings like a bath house or portal, training programs for better mining and safety installations to guard against accidents. Typical of these stories are one in a recent issue of the *United Electric News* of the United Electric Coal Cos., describing the new Cuba washery, and another about a new bath house in the *Safety Bulletin* of the Consolidation Coal Co. (W. Va.)

Articles like these keep the human interest foremost, picturing and naming miners as they operate new machines, dress in the new bath house, meet in training classes and work with new safety devices. Also, they explain these advances in terms of what they mean to the individual miner—safer and easier work, more security and a higher standard of living.

Another subject that comes close home to the miner is his company's program to improve community life. The *Hanna Coal News*, for example, along with many other publications, plays up company-sponsored baseball leagues, community picnics and other recreational activities. *Mecco News*, of the Midland Electric Coal Corp., and the *United Electric News* recently used two-page picture-and-story spreads to show their reclamation of stripped-over lands. At

various times, other coal-company publications have featured community health programs, clean-up-and-paint-up campaigns, new water-supply systems, new swimming pools, recreation centers and schools.

To share top-management thinking with miners, "The President's Corner," a monthly page in the *Lorain-Lorado Journal*, invites miners to think along with the company's president about such subjects as relations with customers and equipment suppliers, the impact of foreign policy on the company, market prospects, etc. Simply written in terms the man on the street understands, these columns avoid the pitfalls of stilted language and heavyweight argument.

Drama in Company's Activities

Tied up with what the company is doing is how it is doing—what it takes in, what it spends and where it stands. Few coal-company publications have exploited this subject, but one, the *Lorain-Lorado Journal*, has done a notable job in passing along this information. The financial report, when published in the magazine, is simple and easy to grasp. "Depreciation and depletion," for example, is called "the amount for replacing buildings, machinery, equipment, etc. as a result of wear and exhaustion" and "interest" is the cost of "the use of other people's money." This straightforward statement throws no dust in the workers' eyes. They know what the company did with its money, how much of it they got and where the company stands.

In addition to showing what his company is doing and where it stands, some publications also tell the miner about the problems his company faces—worker productivity, absenteeism, taxes, government restrictions, competition, markets, etc. Without preaching and without accusing anyone, the weekly *Four Wing News* of the Island Creek Coal Co., for instance, discusses these problems frankly, backing up statements with facts and showing how miners and the company can join hands to lick the problems. In short, the miner is shown that he has a real stake in making his company a going concern and that his management needs his help.

The Coal Industry—Many miners are kept up to date on the industry's progress through their company publications. To mention only

a few, *Warner Ink*, published by the Warner Collieries Co. and its affiliates, often includes among its four pages a paragraph or two on research to widen the uses of coal; the *Safety News* of the Elk Horn Coal Corp. recently gave two columns to an article called "Coal King of Minerals"; and the *Monthly Safetygram* of the Bell & Zoller Coal & Mining Co. ran a story on coal in industrial chemistry.

New laboratories, government-owned and private; research in underground gasification, locomotive design and conversion of coal to oil and gas; new uses for coal and its byproducts; division of the industry's income; facts about who owns the coal industry; industry-wide action on safety and merchandising—these are but a few more of the topics that broaden the miner's outlook and boost his pride in his job and his industry.

Miners Meet Customers

The Company's Customers—To show the miner who buys the coal he mines and how it is used, several publications run a regular article on the company's customers. The *Lorain-Lorado Journal*, for instance, always includes a "Meet Our Customers" column that tells a few facts about companies that use Lorain-Lorado coal—a rubber and a stamping and enameling company, to mention only two from recent issues. *Warner Ink* recently carried a story about a new power plant that burns Ohio coal and *Four Wing News* reprinted an article called "Electric Power Utilities As Coal Customers," published originally by Appalachian Coals, Inc. Along with these, other publications have featured articles on steel and rolling mills, railroads and home owners as coal users.

National Affairs and Issues—Down-to-earth discussion of public issues and national affairs affecting miners and the industry often appears in coal-company publications as a step in building well-informed citizenship in mining communities. For example, *Mecco News* recently had an editorial on federal taxes and their effect on money available for new-business investment and the *Monthly Safetygram* published data on federal social security. "The President's Corner" of the *Lorain-Lorado Journal* took up the Marshall Plan and exports in a recent issue, and *Four Wing News* reprinted an article on food prices that first appeared in *Colliers* magazine. Arti-

cles like these are simply written, often with a touch of humor. They state the facts and come quickly to the point, relating public issues to miners' experience and living.

People—News and articles about men at home and on the job stress the human element in coal mining and show the individual's share in his company's tasks and gains. Promotions get a big play, as do stories about old timers and the father-son teams often found, for example, in the *Red Jacketeer* of the Red Jacket Coal Corp. *Warner Ink* prints a monthly column called "Meet the Family," with a picture and story about a miner, a fireboss or an official who has shared in the company's growth. Stories about men and their hobbies, like gardening, fishing, carpentering and collecting, show miners in their free hours and cut across a wide range of interests. *Hanna Coal News*, which sometimes builds a story out of a passing fad, recently ran a word-and-picture story on the hats men wear around the company's operations—soft hats, hard hats, firemen's helmets, hats with visors in front and hats with brims all around. The *United Electric News* runs a regular monthly spread of pictures called "Familiar Faces and Figures Around the Mines" and the *Strip Pitter* of the Pittsburgh & Midway Coal Mining Co. has a similar page of pictures called "Around the Diggin's."

Stories and pictures about people and what they are doing point up the company's interest in the individual and promote friendship among miners without resorting to trivia and keyhole reporting. Along these lines, W. H. McWilliams, editor, *Hanna Coal News*, describes his paper's policy: "No material is accepted for publication in the *Hanna Coal News* unless it would be accepted by an editor of the district's leading newspaper . . . It is my belief that you can interest your employees by putting high-class material in print as well as the general public, but by inserting personal quips you interest no one except a small circle of the victim's acquaintances."

Safety—Safety runs like a theme through all coal-company publications. In fact, the very names—the *Safety Bulletin*, the *Monthly Safetygram* and the *Safety News*—suggest that safety inspired the start of many of them whose interests have since expanded to include other topics. The *Safety News* of the Elk Horn Coal Corp. prints a brief analysis of every accident

during the month and illustrates each one with a drawing, besides running community news and boosting the coal industry generally. The *Bugduster's Safety-News*, published by the Union Pacific Coal Co., like many others, summarizes the monthly safety record, announces the month's top loading crews and carries a page of ladies' features. The *Lorain-Lorado Journal* carries a word-and-picture series called "The Safe Way" showing, for example, how to wear mine clothing and how to couple cars.

Safety awards and meetings also get good coverage. *Our Bread and Butter*, a four-page monthly of the Locust Coal Co., gives a full account of the monthly safety rally attended by miners and their families and the award of safety and door prizes. *Hanna Coal News* recites the monthly safety record for foremen and their crews and gives a big splash to district safety meets. The *Red Jacketeer* usually has a two-page section called "In the Field of Safety and Training."

Safety for All

In addition to safety on the job, many publications give space to safety at home, on vacation and in driving, going to school and doing chores around the yard. Much of this naturally is directed at wives and children as well as miners. The accepted theory seems to be that accidents off the job hurt just as badly as those on the job.

Community News—Although a good many publications carry some community news, magazines and papers published for miners in isolated towns give greater attention to such coverage and, in doing so, serve the purpose of a local newspaper. *Four Wing News*, for instance, announces local movie programs, carries reports of church and other group meetings and writes up weddings and other social events. The *Check Board* gives nearly half of its 24 pages to social news, with pictures, from each of its half-dozen or more communities and the *Red Robin*, issued by the Eastern Coal Corp., gives a big play to weddings, meetings and outings in the towns near its several operations, as does the *Safety News* of the West Virginia Coal & Coke Corp. Regular features in these and other publications are directed at wives and daughters, with hints and news about food and recipes, styles, beauty and interior decoration.

Apparently, most editors of coal-

company publications accept the old Chinese proverb that one picture is worth a thousand words, adding their own belief that a picture with a person in it is worth a thousand more. Pictures of men at work in new developments and with new machines, pictures of men, wives and children off the job and at play, pictures of old timers and officials, group pictures and single pictures, action pictures, funny pictures, dead-serious pictures, cartoons and drawings—these add sparkle and color. Nearly always, the people are named, thus adding weight to the personal slant.

To explain operating methods and safety, "how to do it" pictures are effective, as shown in the *Lorain-Lorado Journal's* "The Safe Way" series. Also, "how not to do it" drawings, like those in the Elk Horn Coal Corp.'s *Safety News*, direct attention at hazards.

Cartoons Draw Interest

Cartoons are used to good advantage in driving home almost any idea. In some instances, editors have created a fictitious cartoon character to illustrate their points in issue after issue. "Picco," the cartooned mining man of the Pittsburgh Coal Co.'s *P.C.C. News*, is shown variously at his foreman's desk, eating lunch at the face, troweling cement into a stone column built from blocks of confidence, loyalty and teamwork, looking at his paycheck and talking with top management. The favorite cartoon character of *Hanna Coal News* is a three-year-old youngster who wears his hard hat at a rakish angle and mimics the things the miners do. Drawings like these add spice and humor and establish continuity from issue to issue.

As pointed out earlier, no one company publication prints all the material surveyed in the preceding paragraphs. However, with sizes ranging from 4 to 24 pages, with many pictures or few and with slick-paper printing or mimeographing, the best of them approach readers in much the same way. The theme is an interest in all the people who share the tasks and rewards of mining coal. They strive for simplicity and readability and use facts instead of abstractions. For the most part, they speak through the language of pictures. Their tone is reasonable and good-humored, not argumentative and belligerent. They concentrate on one or two main ideas per issue—a new development, coal's

future, productivity, costs, etc.

What about cost? That depends on many variables, including, to mention only a few, the number of copies, the quality of paper, the number of photographs and line drawings, the method of distribution, the number of pages and the type of printing—whether mimeograph, Varitype, letterpress or offset. Also, editorial costs vary with size of staff and the time budgeted for the publication. However, the following data, some furnished by coal companies and the remainder estimated by a magazine-production expert, suggest the range of costs that will keep a coal-company publication going:

1. Twelve-page paper, two-color cover; about two-thirds pictures and one-third text; 60-lb. coated paper, 10½x13½ in.; 10,000 copies.

Paper, printing and engraving	7.42
Handling	0.5c
Mailing	2.0c
Editorial	2-10.0c

Cost per copy.....11.9-19.9c

2. Twenty-page magazine, two-color cover; about one-fifth pictures and four-fifths text; 70-lb. coated paper, 8½x11 in.; 1,600 copies.

Paper, printing and engraving	41.6c
Photography	3.7c
Distribution	0.9c
Editorial	12.5c
Other charges	1.3c

Cost per copy.....60.0c

3. Twenty-two-page magazine; about three-fifths pictures and two-fifths text; color-combination plates throughout; coated paper, 70-lb. cover, 50-lb. inside pages; 8¼x10¾ in.; 800 copies.

Typesetting and composition	68.7c
Paper	6.8c
Engravings	68.7c
Distribution	1.5c

Cost per copy, excl. editorial.\$1.457

4. Eight-page news sheet; about one-sixth pictures and five-sixths text; 50-lb. coated paper, 9¾x12 in.; letterpress; 400 copies.

Printing and paper	50.0c
Engravings	22.5c
Distribution	1.0c

Cost per copy, excl. editorial 73.5c

5. Four-page news sheet; about one-third pictures and two-thirds text; 60-lb. paper, 8½x11 in.; offset, 1,350 copies.

Typesetting	4.4c
Printing and paper	7.1c
Distribution	1.0c

Cost per copy, excl. editorial 12.5c

6. Eight-page booklet, two-color cover; about one-eighth drawings and pictures, seven-eighths text;

60-lb. paper, 8½x11 in.; Varityped and offset; 1900 copies.	
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Varitype	3.7c
Printing and paper	10.7c
Distribution	1.0c
Cost per copy, excl. editorial	15.4c

7. Six-page mimeographed booklet with drawings; 8½x11 in.; 6,000 copies.

Paper and ink	0.73c
Stencils and cuts	0.07c
Machine operation	0.29c
Assembling and distributing	0.29c
Editorial	0.26c

Cost per copy.....1.64c

Costs, as may be seen from the figures above, range all over the lot. There is no denying a direct ratio between the budget and the attention-getting power of the publication. That is not to say that a lavish budget guarantees a competent job of employee communication. In fact, a pretty successful job is being done month after month by several inexpensive news sheets and safety bulletins. However, a bright, attractive magazine or paper, with good paper, good printing, lots of pictures and even some color, commands interest right off and assures a good start.

At the same time, an expensive, sparkling magazine cannot substitute for a sound labor-relations policy, personal contact between top management and miners and a real program to improve the opportunities of the people whose fortunes depend on the company. In fact, no coal-company publication can succeed without this foundation.

Once this basis is firmly laid down, the following will help the publication along to success:

1. Clear objectives that automatically set standards of integrity, content and readability.

2. Long-range planning to reach those objectives, with the realization that confidence-building and education take time and permit no let-up.

3. Integration of editorial content with company policies, made possible by ample editorial contact at the top-management level.

4. Plenty of contact at the miner level, livening up the human approach and uncovering subjects the miner wants and needs to know.

5. A trained editorial chief, with a staff of field correspondents who will give miners a sense of participation.

6. An adequate budget for travel and field interviews, photography, printing and engraving and distribution.



CLEARNESS in front of the photographic light (upper left) shows absence of dust because cuttings are deposited under the pile.

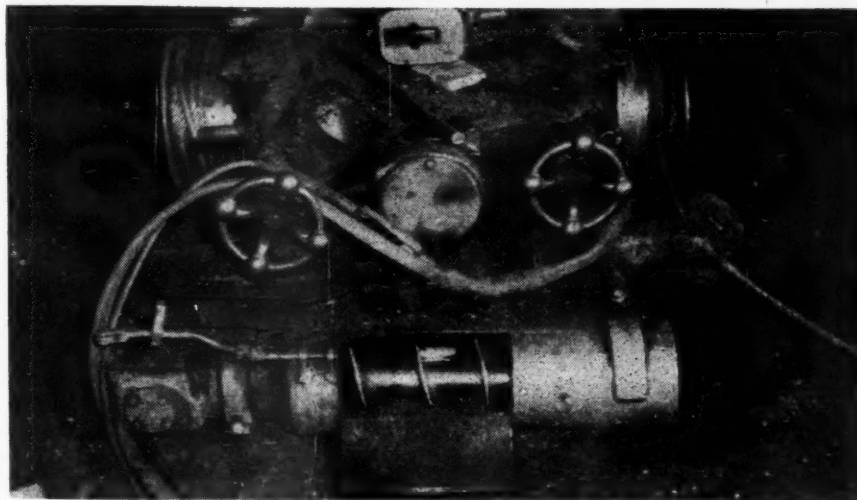
Better Mining With Bugdusters

Mechanical Bugdusting, by Relieving Crew of Shoveling Task, Raises Efficiency and Promotes Safety—Dust Reduction, Coarser Cuttings, Cleaner Kerfs, Less Power and Pleasanter Work Are Additional Advantages

By RALPH G. PERRY

Mining Engineer, Sahara Coal Co., Harrisburg, Ill.

SINCE THE TIME machines were first used to undercut coal recurring attention has been given to the problems arising in handling the cuttings. The large volume of slack, or "bug dust," produced must be moved away from the machine while it is cutting to prevent clogging the chain and to keep coal from being carried back into the kerf. The volume of slack depends upon the height of kerf, the length



TWO VIEWS of the bugduster showing position on machine and inspection door open to reveal screw.

BUGDUSTERS ELIMINATE HAND SHOVELING AND DUST HAZARDS



WITH THE BUGDUSTER, hand shoveling is eliminated and cuttings are windrowed automatically for easy loading.



BUGDUSTER screw and sweep are displayed by Mike Reshete, mine electrician.

of cutter-bar and the speed the machine travels across the face. With a 6-in. kerf, an 8- or 9-ft. bar and a feed of 32 in. per minute, it can readily be seen that cuttings will come out of the kerf at the rate of approximately 900 lb. per minute. It is impossible for a man to shovel all this slack away fast enough to prevent trouble and he does not have time to put it in a convenient place. In fact, his inability to do both things is one of the problems.

Cleaner Kerf: Less Power

The accumulation of slack carried back into the kerf by the cutter chain, which runs between 350 and 550 f.p.m., seriously interferes with the successful operation of the machine. It clogs the cutter chain and prevents free movement of the chain links and of the chain in the guides, thus increasing power required. The slack packs in the guides, tightening the chain and throwing a greater strain on it, thereby heightening the possibility of breakage. In addition, the slack is ground into fines, making it less desirable and increasing the power consumption.

Bugdust must be removed from the kerf to insure a successful fall of coal when the place is shot. Long-handled flat shovels usually are employed, the work is hard and repre-

sents considerable time and labor. The percentage of coal left in the kerf depends on the man who does the work. Usually he removes about 30 percent of the cuttings.

Ten Units in Service

These and other considerations were responsible for the development of power bugdusting equipment for use on shortwall cutters. Sahara installed its first such unit—a small flight-type conveyor—in 1941. The necessity of removing the unit when the machine was moved, high maintenance and relatively large dust production, resulted in a change to the present unit, which has been installed on ten shortwalls in Sahara No. 16 mine—these ten being all the machines to which the bugduster could be applied. The last unit went into service in 1947.

These Goodman "Bugdusters," used on Goodman 512 shortwalls, consist of a simple screw conveyor that is attached to, and becomes a part of, the shortwall machine. A chain drive inclosed in a case extends from the intermediate shaft of the shortwall to the bugduster. A spring-controlled safety-release clutch protects the mechanism against damage which might occur if a cap-piece, a cutter-bit or other foreign material finds its way into the conveyor. A manually operated

clutch is used to disengage the conveyor from the drive. This clutch is mechanically interlocked with the inspection door, which is in the conveyor case. Power is disconnected from the conveyor when the door is open.

The screw of the conveyor is approximately 8 in. in diameter and 30 in. long. It revolves at the proper speed to move the slack away from the machine, but not fast enough to cause excessive wear. Beneath and fastened to the cutter-chain drive sprocket is a sweep, or paddle wheel, which throws the cuttings brought out by the chain into the path of the revolving screw.

No Additional Motors

The addition of the bugduster to a machine increases the length approximately 9 in. and the method of attachment makes it an integral part of the shortwall machine. The sweep, running at cutter-chain sprocket speed, and the screw operated by chain drive from the intermediate shaft always run at speeds that match the duty they are expected to perform.

The bugduster provides many operational, safety and economical advantages. With it, it is possible for one man to operate the machine and, since the slack is automatically handled by the bugduster, the runner can watch the cut, adjust the



LOADING with crawler machine into chain room conveyor. Power bugdusting facilitates handling cuttings.



R. G. Perry, mining engineer, Sahara Coal Co.

tilting shoe and tail-rope tension as necessary and give his undivided attention to the important operation of cutting coal. The helper is retained but his cutting duties are reduced to setting jacks in sumping and cutting out, freeing him for roof inspection, timber setting and other operations promoting safety and efficiency.

Dust-Free Air Safer

The slack is discharged on the trailing side of the shortwall machine in a pile that is parallel to the face and about 6 ft. from it. This provides clear space at the face for drilling and lays the slack in position for easy and quick loading. Thus, no hand shoveling of slack is necessary. The slack also is discharged *under* the pile, which is built up from the bottom as with an underfeed stoker, thus practically eliminating dust at the face except for a minimum during sumping. The air is kept clear, providing good visibility. No dust is inhaled by the men and none is thrown into the air current to be carried to other parts of the mine. Thus, a serious hazard is removed, in addition to the safety advantages resulting from freeing the helper for setting safety posts and otherwise keeping the place in safe condition.

The bugduster also has many advantages from the cost standpoint.

Elimination of slack shoveling enables the helper to play a greater part in the prearranged face cycle. Elimination of the arduous task of bugdusting the cut also contributes to permitting the cycle to proceed with greater speed and economy. In addition, instead of the cuttings being thrown in a haphazard manner at the back of the machine, they are mechanically piled in a wind-rowed row from which they are easily loaded. Actual measurement of slack from the bugduster and slack remaining in the kerf shows that 90 percent of it is removed.

Chain Wear and Breakage Cut

The cutter-chain runs free in the guides and link by link. This not only reduces wear and breakage on the chain, but effectively decreases the power peaks otherwise encountered as a result of clogged chains. Average power requirements also are reduced, and savings up to 20 percent have been claimed because the chain does not crush the cuttings and carry them back into the cut. In addition, the cuttings are considerably coarser.

From the maintenance standpoint, the greatest wear is on the five-pronged "sweep" and the outby end of the screw. These surfaces are built up with "Stoody" self-hardening rod. Both ends of the screw are built up and, by changing

ends, the screw gives double the service. At No. 16 mine, the screws are replaced about every year and the sweeps every six or eight months. General machine repairs also are kept down because the inclosure of the bugduster-equipped machine is such that shovels and tools cannot work under it as it travels across the face and get mixed up with the chain, sprocket or bits.

Bugduster Advantages

In the light of our experience, the advantages of the bugduster might be summed up as follows:

1. Less labor for the operation of the machine.
2. Safer operation through elimination of dust hazard and the necessity for manual bugdusting.
3. Coarser cuttings because the cuttings are not carried back under the cut and ground up by chain and bar.
4. Lower power consumption because carrying back and grinding up of the coal cuttings are eliminated.
5. A cleaner kerf, and thus better shooting, because the bugduster removes such a high percentage of the cuttings.
6. A far pleasanter operation for the miner, and thus a more efficient operation.



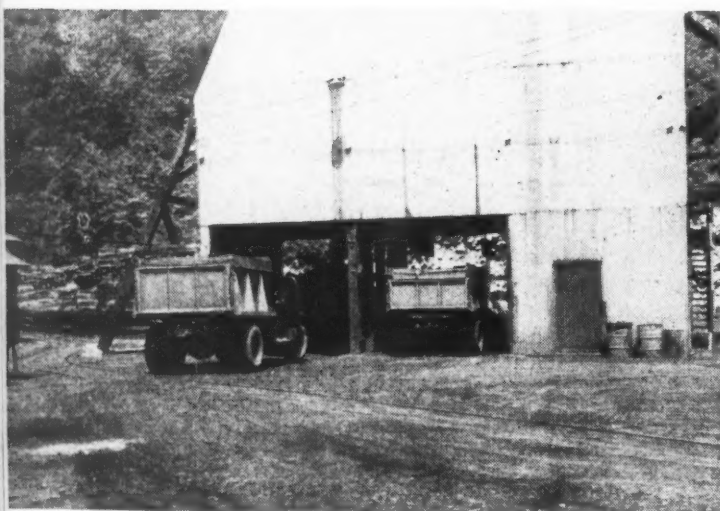
MARKSON BREAKER CONE-CLEANS anthracite and prepares eight sizes for truck trade. Abundant water and storage for both

Quality Preparation Assured

Company-Designed Plant Prepares Eight Sizes of Anthracite for the Truck Trade, Using Cones for Cleaning — Storage Facilities Help Eliminate Delays—Special Attention Given to Breaker Water Supply—Structural Design of Wood Plant Incorporates New Features

By RALPH R. RICHART
Associate Editor, Coal Age

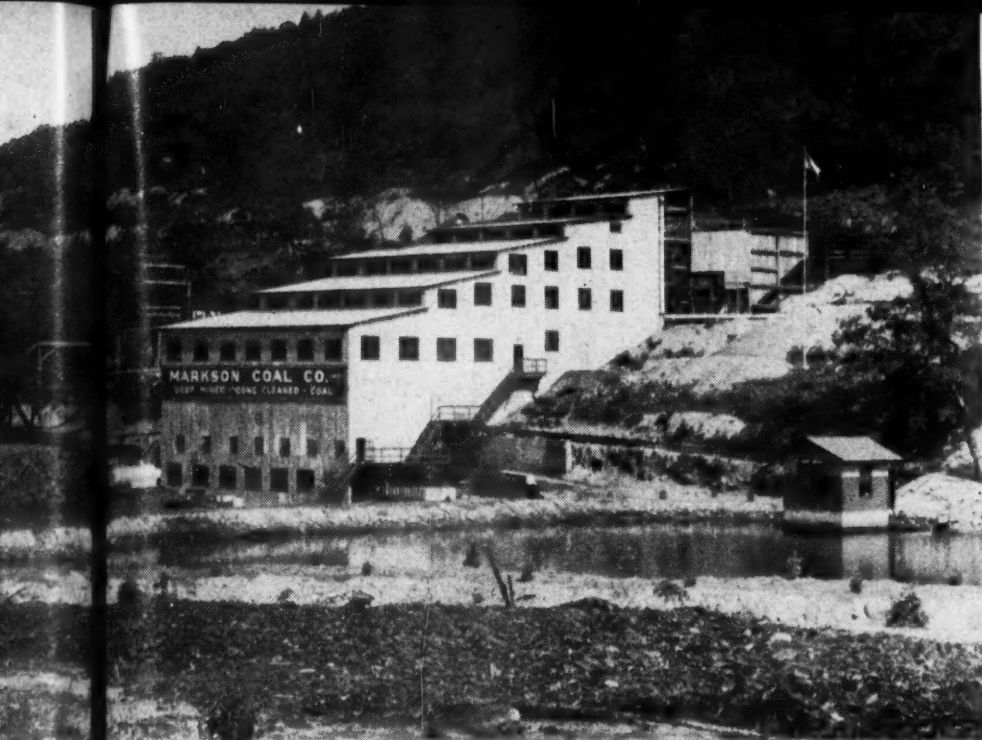
REPEAT BUSINESS is the test of quality preparation. In the case of the Markson breaker of the Markson Coal Co., Inc., Good Spring, Schuylkill County, Pa., deep-minded, cone-cleaned anthracite (No. 4 to stove), plus quick loading from 100-ton prepared-coal storage bins, attracts trucking trade from as far as 200 miles. Raw coal is trucked 3,400 ft. over a private road to the breaker. Rigid ash control has created a marked demand for the ultra fine sizes as pulverized fuel for power plants.



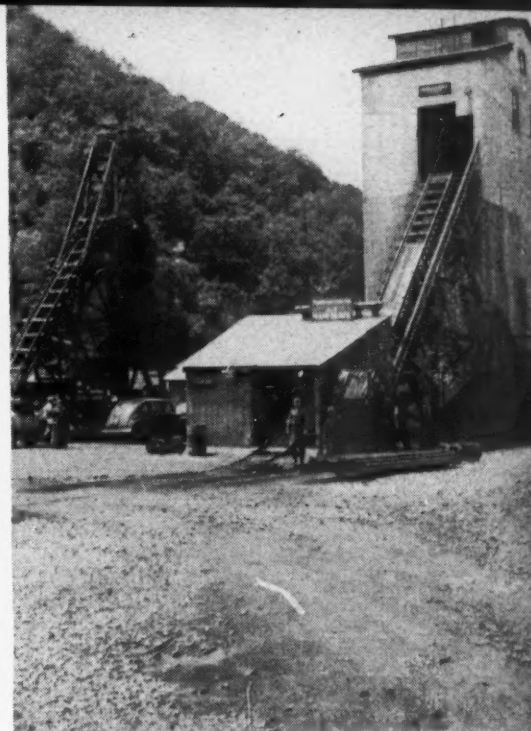
TWO TRUCKS can load simultaneously at the Markson slope. Trucks use private road to breaker and return on the highway.



FACILITIES at the breaker will soon permit as many as six trucks to dump at once into an 800-ton raw-coal storage bin.



raw and prepared coal permits breaker operation on a factory-like schedule.



MAIN SLOPE (right) and man slope.

in Markson Breaker Design

The Markson breaker began processing coal in March and is a "Markson Made" plant, both as to engineering and construction. The Markson Coal Co., Inc., was named for Mark Mosolino, son of Anthony Mosolino, the president. The breaker was designed by the company's engineer and superintendent, Don H. Burkett, whose experience includes almost 40 years with the engineering departments of some of the major anthracite operations.

Wood instead of steel was selected for the breaker structure because

of the acute shortage of building materials. The use of wood—oak was employed since pine was not available—increased building costs and also retarded construction progress.

Among the unusual structural features of the breaker are:

1. Foundations, built on disintegrated shale soil, designed to limit the bearing load to 10 lb. per square inch (1,440 lb. per square foot). This is equivalent to the pressure exerted by the ball of a man's foot while walking.

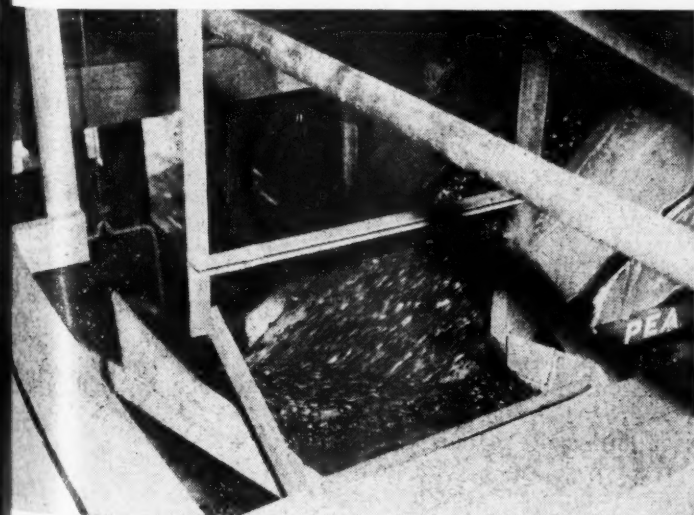
2. Use of a safety factor ranging

from 8 to 18 in establishing the size and strength of the framing and supports.

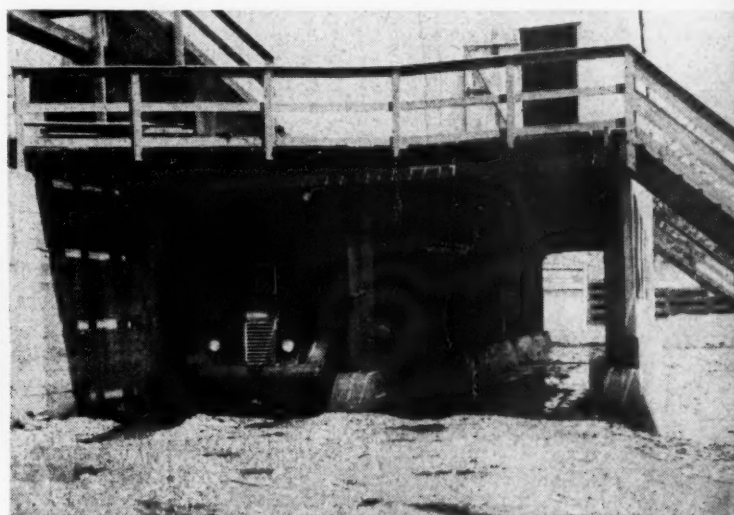
3. Elimination of all X-bracing.

4. "Saw-tooth" roof construction, permitting additional windows for admitting daylight to the center of the interior.

5. Use of continuous horizontal stringers anchored in the hillside in place of the customary continuous vertical-column construction to reduce longitudinal movement or sway of the breaker. With the old method, when the wood dried the

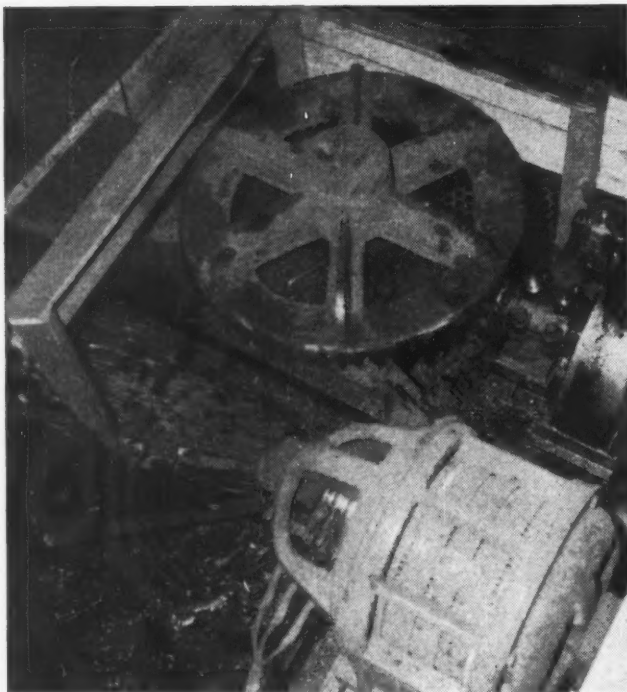


CHUTE POSITIONING and water spray facilitate truck loading. A deduction is made at the scales for water on the coal.



SEVEN TRUCKS can be loaded simultaneously at the chutes and two may load the same-sized coal at the same time.

BREAKER EQUIPMENT AT MARKSON COAL PLANT



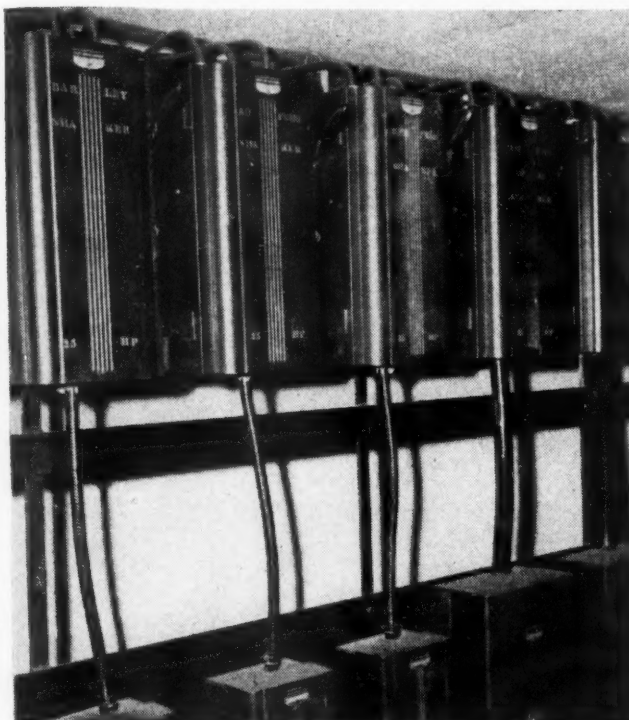
STOVE AND NUT are cleaned in this 8-ft. cone. Wood is collected on the screen left of motor.



PEA AND BUCK, from the 6-ft. cone, are sized prior to entering the spiral chutes to the 100-ton prepared-coal storage bins.



BEAVER-TAIL-TYPE sprays at loading chutes carry undersize through stationary screen to the degradation circuit.



ASBESTOS-LINED STARTER ROOM protects the Markson breaker against one possible source of fire.

members could move horizontally at the connections.

6. An 800-ton raw-coal storage bin and 100-ton bins for each size of anthracite prepared to permit the breaker to operate as much as half a day without additional coal from the mine or truck customers at the breaker.

7. Fixing of water requirements for the breaker on the basis that 1,000,000 gal. of water is needed for preparing 1,000 tons of anthracite coal.

A creek had to be rerouted before construction of the breaker could be started. Approximately 255,000 board feet of lumber was required

for the 168-ft.-long, 72-ft.-wide, 35-ft.-high structure and about 1,000 cu. yd. of concrete was used in the foundations.

The steady rate of raw-coal feed, free use of water throughout the plant, careful sizing of the coal before and after cleaning and return of any degradation for re-prepara-

tion all facilitate the work of the preparation equipment. The water launders and sprays aid in washing and sizing the coal. The beaver-tail-type of spray is effective in rolling the coal particles and further aids the coal in getting through the proper size of screen. Capacity of the breaker is 1,400 tons in seven hours.

800-Ton Raw-Coal Bin

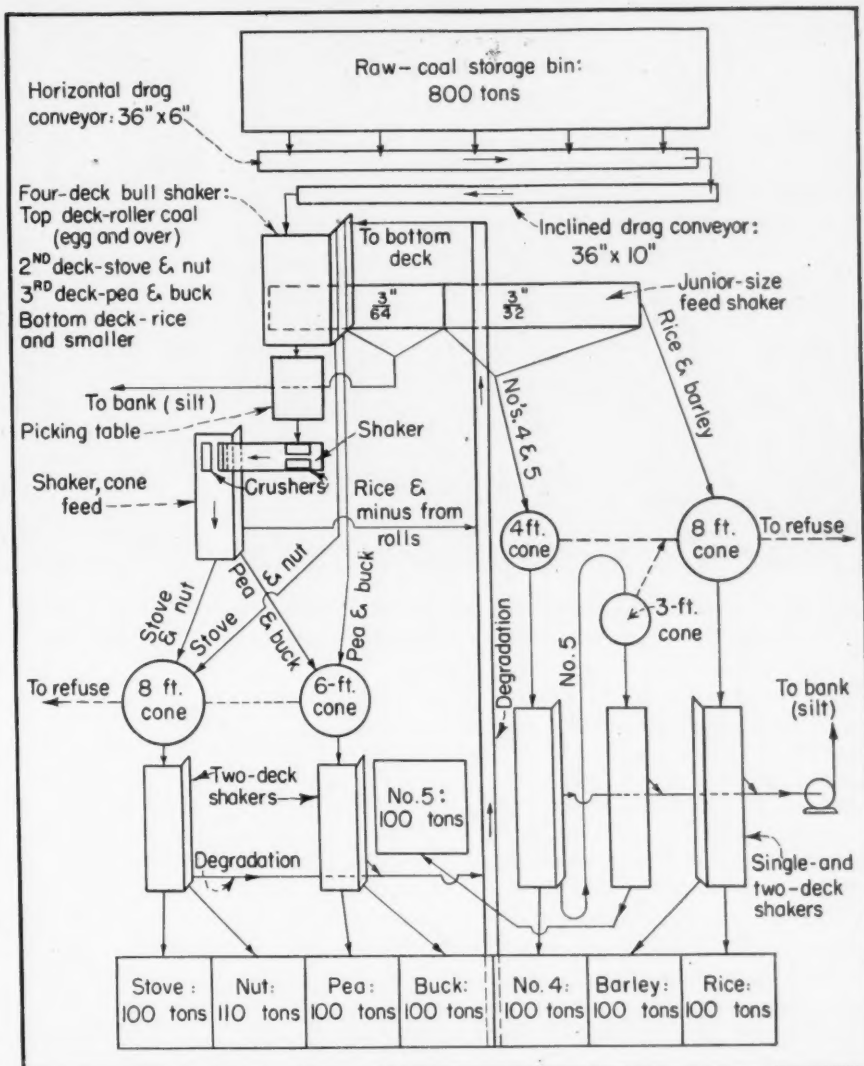
Flow of coal through the Markson breaker is shown in the diagram at the right. The raw coal is discharged from pockets in the 800-ton storage bin into a 36x6-in. horizontal-drag gathering conveyor. A second drag conveyor (36x10 in.), mounted on a 39-deg. angle, elevates the coal to the top of the breaker, where it is fed to a four-deck bull shaker. The bull shaker separates the senior and junior sizes, the buck and larger going into the senior sizes. The top deck delivers the roller coal (egg and over) first to a picking table and then to series crushers consisting of No. 1 and No. 3 Wilmot rolls. Two-stage crushing has been found to step up crusher capacity and curtail the production of fines. It provides a more uniform product and favors the production of a higher percentage of the top size.

The final product from the two crushers is sized on the two-deck cone-feed shaker. The stove and nut, or the product of the top deck, passes to an 8-ft. Menzies cone separator while the pea and buck passes to a 6-ft. cone. Other feed circuits to these cones originate at the second and third decks of the bull shaker. Clean coal from the two cones passes to individual two-deck classifying screens and to 100-ton storage bins.

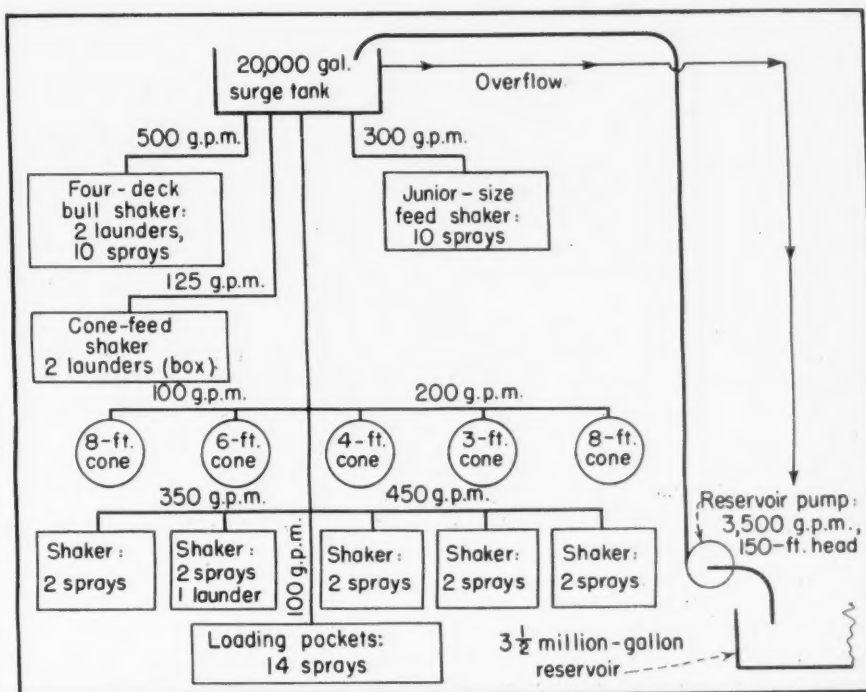
How Separator Works

The Menzies cone separator, available since 1934, is an inverted 60-deg. cone with a short cylindrical top section and a classifier column, several feet long, at the base. A stirring shaft is located at the vertical axis of the cone. Circulating water, exerting an upward force, is introduced into the cone through rings of nozzles at several levels and also at the bottom through the classifier column.

The coal feed is introduced just below the water level at the center of the cone. The circulating pump forces water into the cone, controlling a bed of intermediate-gravity material, consisting chiefly of bony



FLOW-SHEET, MARKSON BREAKER. An 800-ton raw-coal storage bin and 100-ton bins for each size of anthracite prepared permit the breaker to operate as much as a half day without additional coal from the mine or truck customers at the breaker.



WATER REQUIREMENTS for the breaker were predicated on the rule that 1,000,000 gal. is needed for preparing 1,000 tons of anthracite.



LEFT—SILT pumped to slush banks settles through three basins. Only clear water enters the stream. RIGHT—OPERATING PERSONNEL: Norman Mortimer, coal inspector (left), Harold Klinger, helper, and Albert Parker, chief electrician; Frank Panchison, stripping engineer.

coal, on which the coal floats over the top and into a launder. The heavy refuse passes through the mass of intermediate-gravity materials and into the refuse conveyor. The V-notch weir, in the weir box at the top of the cone, which is connected with the refuse-conveyor casing, controls the rising currents of water through the separator.

Weir Functions Automatically

When the bed of materials becomes heavy, the water rises in the refuse compartment and overflows through the weir, thereby decreasing the upward velocity of the water through the classifying column at the bottom of the cone. This permits enough of the intermediate-specific-gravity materials to pass into the refuse conveyor to keep the bed of intermediate materials at the proper level. With the weir functioning automatically, the water supply at the bottom may be adjusted to prevent loss of coal with a very low tonnage or a very low refuse content of feed, thus permitting the cone to take care of peak conditions.

Three motors are required in the operation of the 8-ft. cone: a 15-hp. motor driving the agitator through a V-belt (Goodyear) and a totally inclosed speed reducer; a 7½-hp. motor-reducer and chain drive for handling up to 40 tons per hour of refuse in the gravity discharge elevator; and a 75-hp. motor for driving a 7,500-g.p.m. circulating-water pump operating against a head of 40 ft.

To facilitate controlling the bed of intermediate-gravity material in

the cone, the company, in this instance, asked the cone manufacturer, The Finch Mfg. Co., Scranton, Pa., to supply cones with a horizontal manifold instead of the vertical type for feeding the zone regulating valves. Changing the setting of one of the regulating valves, when the horizontal manifold is used, the Markson officials contend, cannot affect zones in the cone fed by other regulating valves from the same manifold. The management is so well pleased with the operation of the cones and with their low make-up water requirements, which are estimated to be about 20 g.p.m. per cone, that three additional cones are to replace other equipment now cleaning the junior sizes—rice and smaller.

Junior Sizes Also Cleaned

The junior sizes—rice and smaller—begin their circuit through the breaker at the four-deck bull shaker. The rice and barley pass over the fourth deck and No. 4 and smaller pass through it. To facilitate the cleaning and separation of these products, the junior-size feed shaker is double-decked half way to keep from mixing the rice and barley with the No. 4 until after the silt has been removed through a 3/64-in. screen. To affect a separation for the junior-size cleaners, No. 4 is passed through a 3/32-in. screen and barley, with rice, through a 3/16-in. screen.

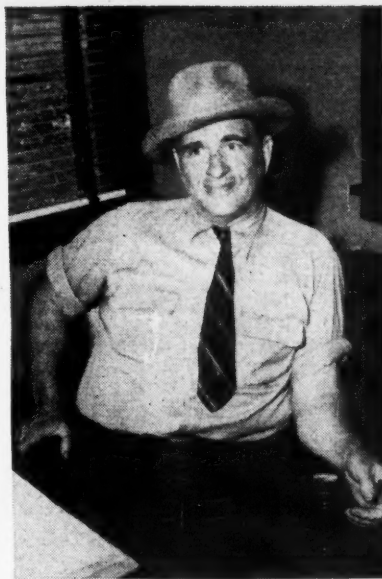
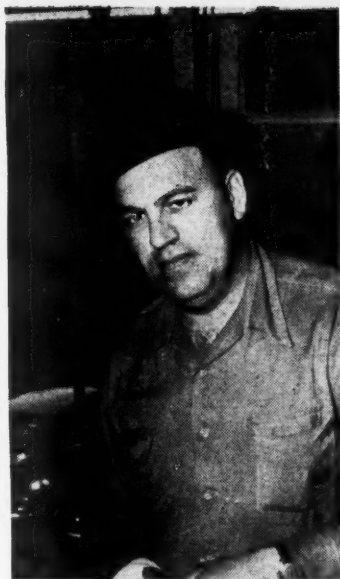
An 8-ft. Menzies cone will prepare rice and barley. Also, 4- and 3-ft. cones in series will prepare No. 4 and No. 5. A major factor in the installation of these cones is

their lower water consumption in comparison with the original equipment. After cleaning in the cones, the junior sizes are again sized on the dewatering screens and routed to the 100-ton prepared-coal storage bins.

Stove, nut, pea and some buck are sold primarily for domestic use. Buck, rice, barley, No. 4 and No. 5 (to be available in the near future) are sold as steam fuel. No. 4 and No. 5, classified as pulverizing coal, also go to power plants. Trucks can load from two levels: the upper level, a one-lane road, is for No. 5 customers; the lower level, a double-lane drive, is for customers wishing the other seven sizes of prepared coal. Seven trucks can be loaded simultaneously at the chutes and two may load the same-sized coal at the same time. During the loading of the trucks, the coal slides from the 100-ton bins over a short stationary screen where water sprays help to divert the undersized particles to the degradation circuit for re-preparation. A 34-ft. retail scale and a 30x30-ft. four-room office building, housing clerks and weighmasters, permit 24-hour service to truckers. Coal samples are tested in the basement of the office building by Norman Mortimer, coal inspector.

Water Cleans and Moves Coal

Water requirements for the Markson breaker, as previously noted, were predicated on the rule that 1,000,000 gal. are needed for preparing 1,000 tons of anthracite. Aside from its use in the cleaners, water performs three important



MARKSON OFFICIALS: Anthony Mosolino, president (left), Ed. Weyman, vice president; Carl G. Schilbe, secretary-treasurer; and Don H. Burkett, superintendent and mining engineer.

duties: (1) getting the dirt and silt into solution at the four-deck bull shaker, from which it is pumped immediately to the slush pond, (2) facilitating the sizing of the products on the screens and (3) speeding the movement of the coal through the chutes.

Year 'Round Water Supply

A 3½-million-gallon fresh-water supply dam (see accompanying illustration) replenished by run-off water from a considerable watershed and also by an almost inexhaustible underground reservoir (abandoned mine nearby), provides the breaker with a dependable water supply, even during the summer. Much of the water pumped to the breaker is used to dispose of the breaker's refuse (about 15 percent of the raw-coal feed) and, therefore, is used only once. About 1,000 g.p.m. is used to convey the silt to a series of three slush deposit banks where it has three chances to settle out. Only clear water leaves the last slush basin.

Piping circuits in the breaker are arranged so that the entire system can be drained by merely opening one valve. This precautionary measure will prove invaluable in safeguarding the wintertime operation of the breaker. The 3,500-g.p.m. Ingersoll-Rand centrifugal pump pumps water from the dam to the breaker's 20,000-gal. surge tank through 12-in. Johns-Manville Transite pipe, against a 150-ft. head. Still another 8-in. Transite line carries the refuse from the junior-size cleaners to the silt pond. The other seven centrifugal pumps

Markson Coal Co.

HEADQUARTERS OFFICIALS

Anthony Mosolino, President
Ed. Weyman, Vice President
Carl G. Schilbe, Secretary-Treasurer
Paul K. Schultz, Director
Leo S. Deegan, Director

OPERATING OFFICIALS

Don H. Burkett, Superintendent and Mining Engineer
Walter Gordon, Inside Foreman
Albert Parker, Chief Electrician
Wayne Malick, Shop Foreman
Gerney Smith, Outside Foreman
Fred. Schwalm, Breaker Foreman

about the breaker are Barrett-Haentjens and are equipped with stainless-steel impellers and shafts.

Electric power at 23,000 volts is purchased from the Pennsylvania Power & Light Co. and stepped down to 440 volts at the breaker's 900-kva. bank of transformers. The 3-phase 440-volt connected load aggregates 753 hp. A separate line switch-and-fuse unit is installed with the magnetic starter for each motor. Twenty-three of these starters are grouped in a Transite-lined room centrally located in the breaker. Surplus Navy Type THFA-150 cable was used for the power circuits instead of the conventional wire-and-conduit system. The metallic braid on the cables serve as the station ground. Most of the breaker motors are of the wound-rotor (slip-ring) type. The operation makes use of the inherent high-torque and speed-regulating

characteristics of these motors. Where the motors are fully loaded, a choice of operating speeds from 50 percent to full-load speed is available through the use of a drum controller and resistors.

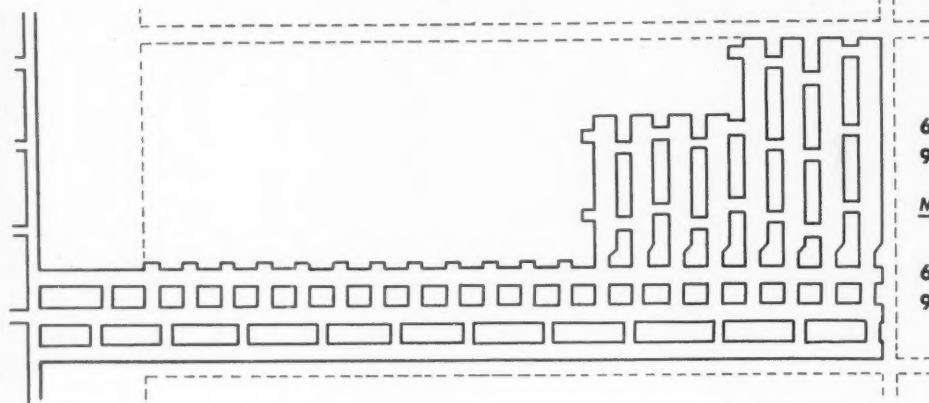
The power company's contract contains a power-factor clause penalizing the customer for a power factor of 0.85 and worse. Between 0.85 and 0.90, the company gives the customer a rebate. At present, the power factor for the mine and breaker is about 0.78. However, 420 kva. of capacitors are to be connected on the 440-volt side (300 kva. at the breaker and 120 kva. at the mine) to boost the power factor to 0.90. Correcting beyond this point would not alter the power-factor charge and is not necessary since the motors already are being supplied with good voltage.

Virgin Anthracite Available

The underground operations supplying the Markson plant are in a section of virgin coal formerly owned by the Philadelphia & Reading Coal & Iron Co. and is adjacent to its Valley View colliery, abandoned in 1931. Seven veins are available for mining. They are, from top to bottom, the Orchard, 4 ft.; Primrose, 13 ft.; Holmes, 9 ft.; Mammoth (Top Split), 25 ft.; Mammoth (Middle Split), 5 ft.; Skidmore, 10 ft.; and Buck Mountain, 6 ft. Both splits of the Mammoth and the Skidmore are being worked at present. The elevation at the top of the slope (in the Skidmore vein) is 950 ft. above sea level and the bottom of the coal basin is 1,200 ft. below sea level.

Cutting Equipment-Moving Cost in Thin-Coal Mining

Taking Pillars to Increase Recovery



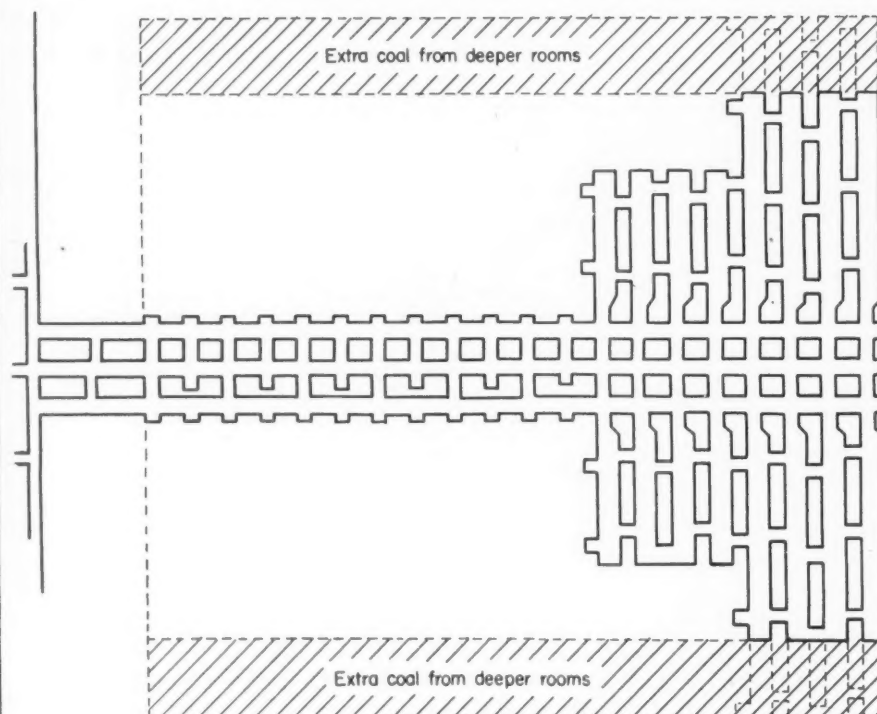
COMPARATIVE TONNAGES

60% extraction	30,600
90% extraction	45,900

MOVING COSTS PER TON, ASSUMING \$2,000 TOTAL COST

60% extraction	6.5c.
90% extraction	4.4c.

Deepening Rooms and Driving Both Ways



COMPARATIVE TONNAGES

Extraction	
60%	90%

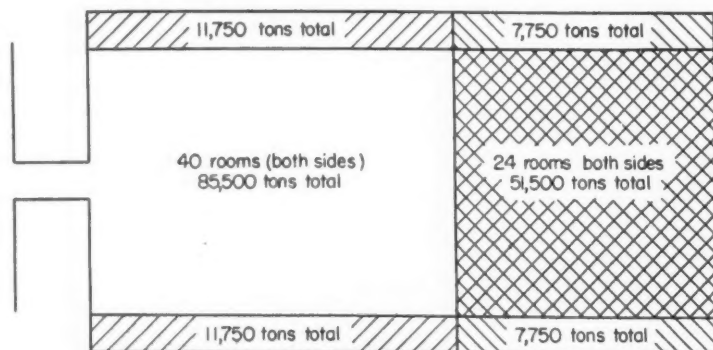
40 rooms (both sides), 300' deep	51,300	76,950
40 rooms, 400' deep	65,400	98,100

MOVING COSTS PER TON, ASSUMING \$2,000 TOTAL COST

Extraction	
60%	90%

40 rooms, 300' deep	3.9c.	2.6c.
40 rooms, 400' deep	3.1c.	2.0c.

Deepening Rooms and Increasing Number

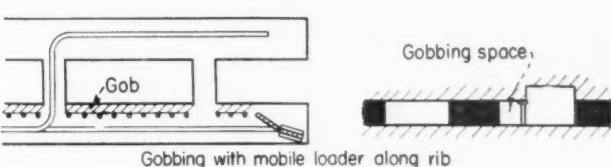
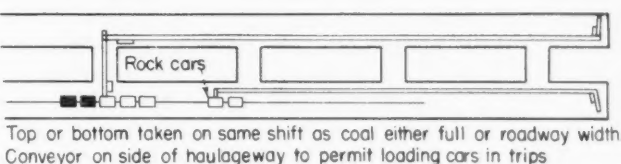
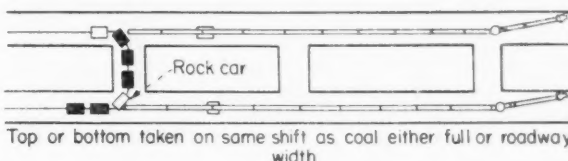
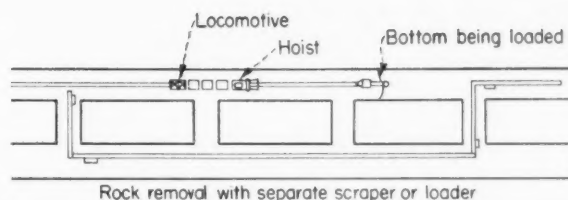
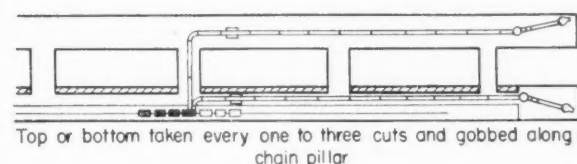
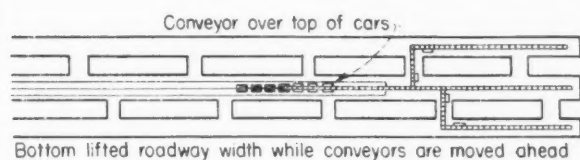
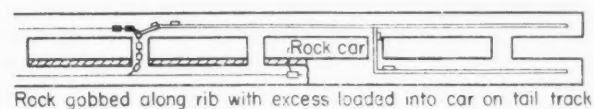
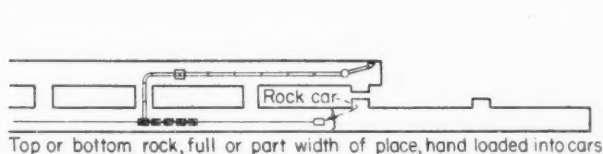


COMPARATIVE TONNAGES

Extraction	
60%	90%

40 rooms, 300' deep	51,300	76,950
40 rooms, 400' deep	65,400	98,100
64 rooms, 300' deep	82,200	123,300
64 rooms, 400' deep	105,600	158,400

Sample Solutions of Rock-Handling Problems



Mining Thin Coal Efficiently

Types of Equipment Available for Thin-Coal Operation— Rock Work and When and How to Do It—Size of Territory as a Factor in Cost of Moving Equipment—Supply Handling and Establishment of Working Cycle

SAYING that thin-coal mining is inherently harder than thick-coal mining and that, consequently, individual productivity normally is lower, is stating no more than an obvious fact. Even if height did not make face operations more difficult, mining seams 24 to 48 in. thick involves more of practically everything per ton—entry-driving, tracklaying, equipment moves, cutting, drilling, timbering, etc. In fact, it can be concluded that the handicaps surrounding thin-coal mining are perhaps as much behind the face as at it. For example, in working a 30-in. seam under the

same mining plan as that employed in 60 in. of coal getting out the same daily tonnage requires driving approximately twice the entry and cutting twice the footage of face, since the yield per foot of entry driven or per foot of cut is only half.

Getting the most in mining thin coal, therefore, requires the use of mining plans suited to the conditions encountered, as well as application of those principles that insure maximum efficiency in operation regardless of coal thickness. Consequently, in planning for thin-coal mining or in making changes

in existing methods for higher efficiency some of the goals might well be the following:

1. Use of mechanical-loading equipment wherever possible.
2. A mining plan providing the maximum in working territory per foot of entry driven and particularly per foot of brushed entry.
3. Complete coal extraction—a second major step toward getting the most out of entry driving, brushing, equipment moves and other dead work.
4. Maximum place width and maximum cut depth to reduce the proportion of dead work per ton at the face.
5. Maximum continuity in transportation and other services to the face (supplies, ventilation, drainage, etc.).

While listed at the end, the last two are perhaps as important as any of the others, since providing

an ample supply of coal and making sure that it is taken away as fast as it can be loaded are the major factors in successful mechanical mining. Coal to load and transportation to take it away mean efficient production, whether in thick coal or thin.

Low-Coal Equipment

Equipment available for mining coal less than 28 to 30 in. or so thick is, at present, restricted largely to hand-loaded conveyors, hand-loaded or self-loading scrapers and self-loading heads on shakers. Hand-loaded conveyors or scrapers are primarily transporting mediums and have the advantages, among others, of eliminating taking top and bottom and increasing the output of men at the face, because of more continuous transportation and reduced lift in shoveling. The increases possible are, of course, subject to conditions encountered at each property, but sufficient evidence exists to support the conclusion that such increases in tons per man-shift run up to 50 percent or, in some cases, more.

Self-Loading Units

Where the coal is over 30 to 36 in. in thickness it is possible to employ several types of self-loading units at the face. These include:

1. Loading machines served by conveyors.
2. Loading machines served by shuttle cars, which in turn discharge to conveyors or mine cars.
3. Self-loading heads on shaker conveyors.
4. Self-loading scrapers.
5. Special loaders, including so-called shortwall and longwall equipment for, respectively, rooms and semi-longwall places.

Where self-loading equipment can be employed and is operated at maximum efficiency, it practically automatically insures a substantial increase in output per man-shift over that attainable under the best hand-loading methods—even those using conveyors or other continuous transportation. The differential again depends upon conditions, methods and type of equipment, but it frequently is on the order of 25 to 50 percent or more over hand loading into conveyors and 50 to 100 percent over hand loading directly into cars in thin coal.

One question that might be asked at this point is: "Which unit is suited to which condition?" No

hard-and-fast answer can be given, although it is generally accepted, among other things, that where roof conditions require considerable timbering, especially in the face zone, the conveyor may have an advantage. The self-loading conveyor (shaker equipped with duckbill) normally is not employed where adverse grades exceed approximately 2 or 3 percent, since its capacity drops off when it has to pull uphill. In installing shakers, therefore, level or only slightly adverse grades should prevail.

Automatic duckbills are being employed successfully in coal as thin as 28 to 30 in. and where roof conditions require close timbering. The power-operated duckbill offers further increases in face efficiency by substituting power swinging of the loading head for the barring previously necessary.

Low-height loading machines feeding onto room conveyors were brought out several years ago to increase productivity at the face. They filled the bill where continuous cutting, drilling, shooting and loading were permitted. Theoretically, conveyors are the most efficient transporting medium. However, capacity in relation to size and weight, the cost of moving them and other considerations act to reduce this theoretical advantage. These and other considerations undoubtedly have been responsible for the rise in shuttle-car transportation behind thin-seam loaders in recent years. Increasing use in coal 36 to 40 in. thick—and down to 30 in. in some instances—is evidence that shuttle cars operating with low-height loading machines offer substantial efficiency increases in thin-seam mining.

Must Consider Roof, Bottom

The old, old factors of roof and bottom also figure in the choice of equipment. With a strong roof and hard bottom a wide choice is available. Where conditions are less than perfect the characteristics of various equipment types begin to exert a greater influence. It is, of course, possible to use any equipment anywhere within limits, but if closer timbering and the use of conveyors, for example, will obviate handling top material, these considerations might control. If top had to be handled regardless of equipment used, one type might lend itself better to that task than another. Soft bottom and water handicap shuttle cars, for example, more than certain other transport-

ing mediums as a general rule, although their other advantages may enable them to offset a moderate amount of water and softness. Soft bottom also is a real handicap in scraper operation.

Careful Study Essential

The general answer to all these questions is a careful, thorough study of natural conditions in relation to equipment characteristics. This applies not only to equipment in rooms at the face but also to equipment between the working place and the outside. Here the question is largely one of transportation, with type of equipment to be employed in driving the haulage and other openings as a subsidiary factor.

Belt conveyors have begun to challenge mine cars and track in the main-haulage field in recent years in thick coal as well as thin. In thin coal, of course, use of belts all the way can make it possible to eliminate much costly rock work, although operation without taking rock to man height makes travel, movement of supplies and other activities in the main opening correspondingly more difficult. For that reason some operators are of the opinion that top or bottom should be taken for a track clear into the room entries, on the ground that the cost of such rock work is more than offset by savings in other directions.

Does Rock Work Pay?

The question of how far rock work should be carried, even where belts are used, is one that deserves greater exploration to show when it pays and when not. Meantime, perhaps, one approach—involving the element of time—might be suggested. In other words, if it were decided to follow a growing trend and limit a mine to a life of about ten years, then move to a new location with new equipment and new methods developed in that period, leaving the rock and taking some penalty on handling supplies, men, etc., might be considered. But, to repeat, the question deserves careful study in view of the fact that one extra man's wages might aggregate \$25,000 or more in ten years. If the handicap of working in low height required several extra men, or their equivalent, the possible savings might warrant an extensive investment to get working height.

Aside from the rock question, distance and time also are elements

in making a choice between belts and mine cars for the main-line haul. The big mine car with good track and a modern locomotive is a combination hard to beat, especially when mine life and distance lengthen. This may account, at least in part, for the fact that many belt-haulage mines are being planned for a relatively short life, although some of the outstanding exceptions date back many years.

Room-Entry Belts Efficient

When it comes to room-entry haulage, however, particularly in thin coal, the belt normally has the advantage because, among other things, it makes it possible to eliminate taking rock in addition to offering more continuous transportation. Since life of the entry is relatively short, any handicaps growing out of low height are minimized. Whether the practice of some companies of taking rock in belt-equipped room entries to facilitate handling supplies and men will spread and alter the picture still is a question. It is logical to assume, however, that the movement will be largely confined to the thinnest coal, barring development of special supply and man-trip equipment to make brushing unnecessary. Also, it is possible in many cases to limit taking rock to only part of the heading width and thus keep down the cost. The test again is whether greater ease of operation with a higher opening results in reduced labor and other economies at least equal to, if not more than, the cost of rock work. Like several other problems involving equipment and methods, careful study is a necessity in every case pending development of a clear trend, if any.

Coal Units Often Handle Rock

Choice of equipment for driving entries in thin-coal mining is relatively easy where top and bottom is not taken, since the same type used in room-and-pillar work normally is employed in driving entries. Where rock is taken, the coal equipment also may be, and usually is, employed in rock handling as well. While the difference in the character of the material handled may affect machine capacity somewhat, this difference normally is not great. However, the quantity of rock handled may exert some influence on equipment choice. Some organizations, for example, have chosen to use coal equipment in coal and then bring in special rock-

handling units, such as portable scraper loaders or specially designed rock loaders, for the rock part of the job.

As examples of the contrast in equipment use, rock tunnels are driven both by regular duckbill-equipped shakers and by special mechanical loaders of the shovel or metal-mine type. In thin coal, the tendency is to use the regular equipment (chain or shaker conveyors, loaders, etc.) in taking both the coal and rock. Some specially designed shakers are employed in this work, and in at least one instance drives have been mounted on trucks to facilitate moving. Portable scraper units with hoe-type or regular scoops and regular loading slides or, in a few cases, loading slides long enough so that a complete trip may be run under them, also are finding increasing use in rock and coal work. Occasionally, also, scrapers discharge to conveyors taking the coal and rock back to the cars.

Rock-Loading Methods Vary

Several methods of taking coal and rock are employed in addition to the infrequent one of shooting and loading them both together. First, top or bottom may be taken all the way across the heading, although this normally involves loading it all out. Or, top or bottom may be taken only roadway width, which, if places can be driven sufficiently wide, often will permit gobbing much of it along one or both ribs. Wide places, where top permits, also provide an opportunity for gobbing any partings or middlemen found in the seam, even though, as in a room heading, no top or bottom is removed. Where possible, therefore, gobbing should be done in the place for maximum economy, although roof and other conditions do not always permit.

Where coal and rock are loaded separately, as usually is the case, two general systems are employed. In the first, the rock is taken after each cut of coal, especially where height is made in the top. Where bottom is taken, there is a tendency toward some increase in difficulty although the difference may not be great. Consequently, it is more common in bottom-lifting mines to drive ahead a conveyor length in coal and then do the rock work at one swoop. Some operators move the conveyor to the next heading and take the rock by hand or with a special rock loader.

A number of variations are possible in either of the preceding sys-

tems which means, again, study of individual conditions in relation to equipment in use or available. In some cases, rock is taken not because of height considerations but because it is cheaper to do so for such reasons as: (1) a better top, giving less trouble and requiring less timbering and (2) a higher output per man because the increased height and better conditions permit more efficient operation, the use of mechanical instead of hand loading, or both.

Larger Territory Adds Tonnage

Because, as stated, productivity in thin-coal mining is handicapped by the necessity for more entry and other normally less efficient work, every possible step should be taken to get the highest possible tonnage from every territory. One obvious method is increasing the size of the territory. For example, assuming a belt is used for transportation, 20 rooms on 50-ft. centers might be worked on one side, making the length of the territory 980 ft., excluding the main-entry pillar and allowing for extra distance resulting from driving the first and last rooms. With three headings 20 ft. wide on 50-ft. centers and rooms 300 ft. deep, measured from the center of the heading, the width of the territory, including a 20-ft. barrier, would be 430 ft. Total area, including half the barrier at the top of the entry (also 20 ft.) would be 425,700 sq. ft., and, if the coal was 3 ft. thick, the tonnage might be 51,000.

Set-Up Cost a Factor

Cost of setting up facilities may now be considered. Things that must be done each time a new territory is opened include not only moving the equipment in and setting up the belt drive, hoist, etc., but also extending the belt, construction of a car-loading sidetrack, installation and extension of power wires, installation and extension of a supply track (if used), timbering the headings, construction of stoppings, installation and extension of a sprinkling line, taking down top (if done), etc. Even without taking top, the cost of all this could run, say, \$2,000 or more. If much top were taken, the expense would be considerably increased.

In other words, all this expense is necessary to make room work possible and, as stated, it is repeated every time a new territory is opened. If, in this example, it is

assumed to be \$2,000 and, because pillars are left, only 60 percent of the coal, or 30,600 tons, is extracted, cost of moving and setting up for room work is 6.5c. per ton. If, on the other hand, pillars are taken to raise extraction to 90 percent, or 45,900 tons, moving and setting-up cost is reduced to 4.4c. Obviously, working rooms on both sides of the entry reduces this cost per ton even more. This would make the territory 720 ft. wide and 980 ft. long and increase possible tonnage from one set-up to 85,500. With a 60 percent extraction, cost per ton would be 3.9c. per ton for moving and setting up; 90 percent extraction, 2.6c.

Taking pillars usually involves extra expense for equipment, timber, etc., and normally is considered to be somewhat less efficient. However, other things being equal, the extra cost frequently should be less than the saving in moving and setting up, especially if rock work also is necessary.

Longer Rooms Cut Set-Ups

Another method of raising tons per set-up is lengthening the working place. Where conveyors are used, this involves questions of motor capacity, strength of pans, chains, etc., extra cost per unit and the like, as well as increased travel time, greater difficulty in getting supplies to the face, etc. But if these problems can be licked economically, adding, say, 100 ft. to the length of the rooms in the preceding example, would mean, depending on whether rooms were worked one or both ways, 7,050 or 14,100 tons more with a 60-percent extraction and 10,575 or 21,150 tons more with a 90-percent extraction. The additional saving, with a \$2,000 moving and setting-up cost—assuming the extra room work could be done equally efficiently—would be 0.6 to 1.2c. per ton. Lengthening rooms also results in more tons per room-conveyor move and should result in a cost reduction in that direction.

More Rooms Offer Savings

Another method of increasing tonnage from a territory is increasing the belt length and adding more rooms. The differential is not as great as working both sides instead of one, taking pillars and increasing room depth, because extra conveyor, track, pipe and other facilities must be installed. However, cost of moving and setting up,

including the sidetrack, would not be raised and, consequently, since tons per territory are increased, a saving should result.

Moving Methods Figure in Costs

While \$2,000 has been assumed as the cost of moving a unit, it is not offered as a typical or average figure. Whatever it is, however, the more coal mined from a territory the cheaper the per-ton cost becomes. The type of equipment used has, of course, some effect on the moving cost itself. Self-propelled loaders and shuttle cars, for example, can move fairly rapidly and can tow or carry other units. Special trucks, sleds, carriers, winches, pullers and the like are being increasingly used to reduce moving labor and cost, supplementing reductions by increasing the tonnage per territory and in other directions. Some of the methods and equipment employed to speed the move and cut cost were summarized in the October, 1947, issue of *Coal Age*, p. 82.

Handling supplies is another problem that becomes tougher as the coal thins. Here, also, special trucks and trailers, "dead" pan lines, carriers operating in conveyor troughs, reversing of conveyors and installation of special inching or jogging controls and other measures are being increasingly employed in thin-seam mines, as well as in trackless operations in thicker coal. Such equipment and methods were the subject of a study in the July, 1946, issue of *Coal Age*, p. 83.

Good Maintenance Essential

Because in thin-coal mining, particularly where conveyors are used, production generally comes from a limited number of places, keeping equipment running becomes even more essential, particularly if it is a gathering conveyor that stops the section when it goes down. Good maintenance is a must, along with keeping efficient parts and assemblies, including, perhaps, spare drives, in or very near the working section. This cuts replacement time, enhances average unit production and, consequently, raises efficiency, meaning that cost comes down.

Care in establishing a tight working cycle takes on added importance in thin-coal mining. While the cycle will differ somewhat with different equipment, different natural conditions and different ideas as to operation, the operations of timbering, cutting, drilling, shooting,

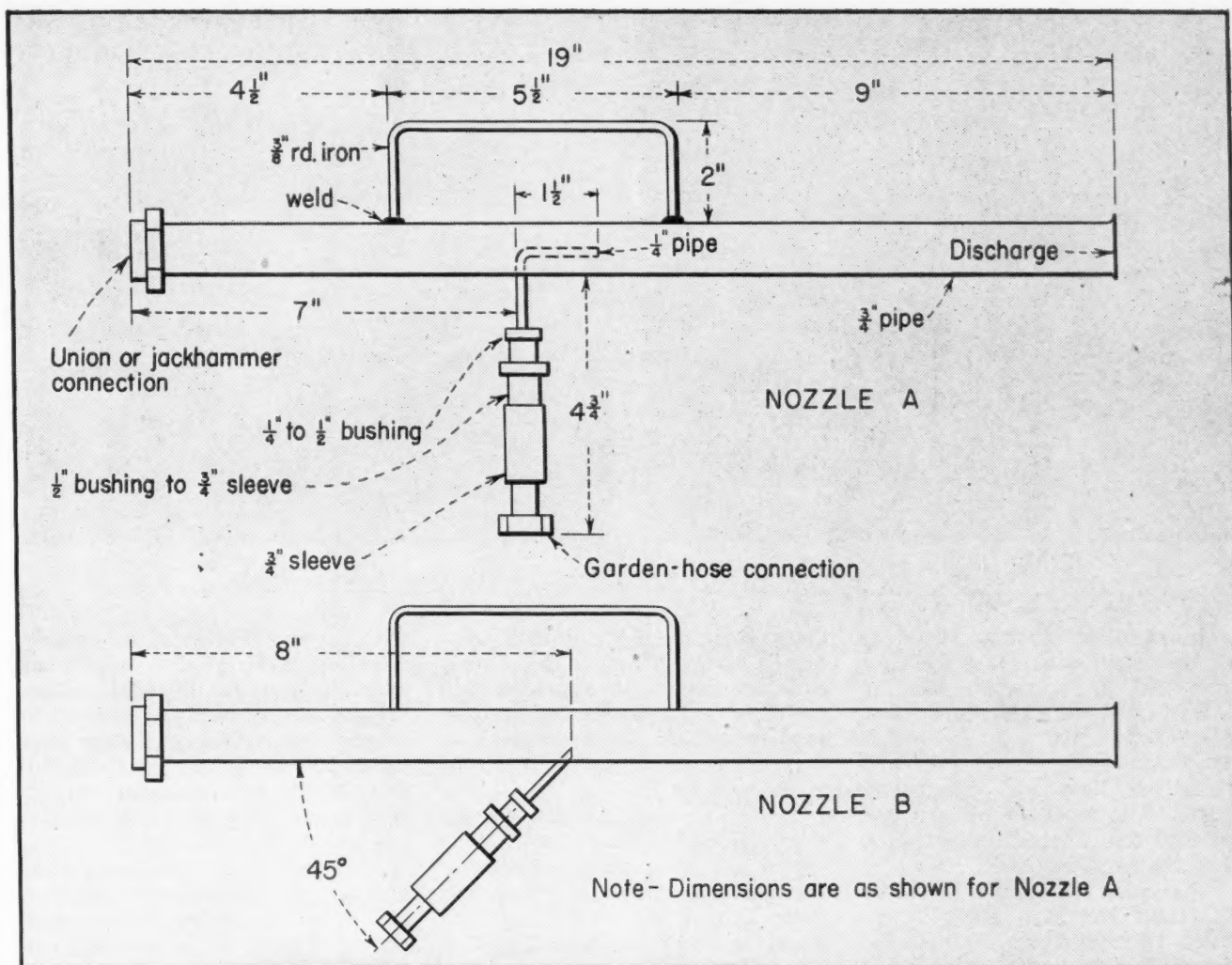
equipment advancement and so on must, in all cases, be closely dovetailed, particularly where conveyors are employed. Therefore, in, say, a conveyor place, cutting, drilling and loading and timbering should be going on simultaneously the major part of the time, and the cycle should come to a partial halt only for extending the conveyor, and to a full halt only when shooting. The work should be laid out so that every man has a job every minute and coal is moving on the conveyor at all times, except when shooting, extending the conveyor and bringing in supplies and equipment on the conveyor is necessary. Careful study of the cycle provides the basis of a schedule of operations that results in keeping the coal coming the maximum possible time.

Deviations in Thin-Coal Mining

When it comes to the actual process of cutting, drilling, shooting, loading and the like, methods in thin coal differ only in degree from those in thick. The major deviation in thin-coal mining include:

1. The necessity of using a different type of transportation unit—as a rule, the conveyor—in the rooms, on the entry, or both. This introduces the moving problem which, as stated, can be made less costly per ton by: (a) increasing the tonnage per territory and (b) providing special equipment and facilities for handling drives, parts and so on, as well as complete machines.
2. The necessity for reaching a decision as to whether to take top or bottom for height for any purpose, including greater ease in handling men or materials.
3. The problem of operating with a limited number of working places, requiring greater care in maintenance and provisions for spare parts near or in the working sections.
4. The problem of bringing in supplies and materials, which, as pointed out, is being solved by special methods and equipment adapted to thin-seam operation.
5. The necessity for a much tighter working cycle at the face, particularly where conveyors are employed.

Reports of tonnages per man comparable to those formerly thought good for thick coal are evidence that these and other problems can be solved in thin-coal mining and thus provide high efficiency and a substantially lower cost.



TWO DESIGNS of the Evans fog gun, showing right-angle and 45-deg. water inlets.

Fog Gun for Safer Shooting

Tests Show Greater Safety Through Change to Multiple Shooting and Use of Fog Gun to Fill Place with Fine Mist—Better Ventilation and Water Action Substantially Reduce Gas and Dust Concentrations in Air

By W. J. EVANS, JOHN E. PASQUAN and L. H. JOHNSON*

A METHOD of shooting coal that practically eliminates all danger of igniting gas and coal dust has been introduced in the State of Washington by the state coal-mine inspection department. The new method was first tried out at the Bellingham No. 1 mine, Bellingham

Coal Mines, Inc., Bellingham, Whatcom County, Wash., where valuable assistance in development was rendered by James H. Pascoe, general superintendent, and L. D. Knill, federal coal-mine inspector.

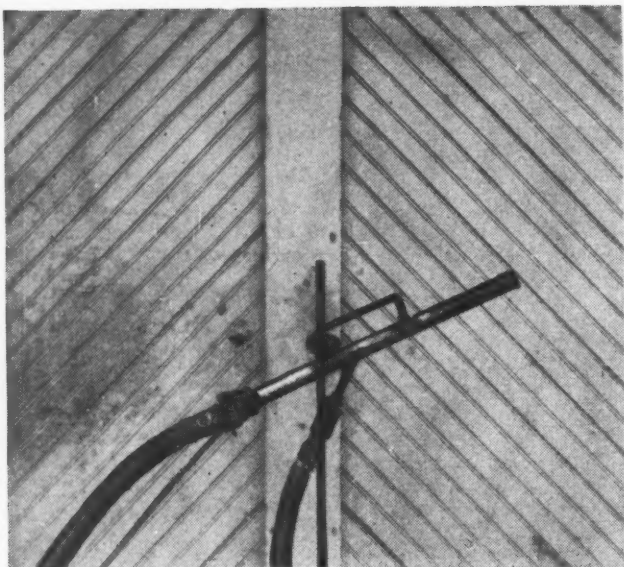
The single-shot blasting system was employed in this mine and it was a smoky, dusty, hazardous job to return to the face to make a test with a flame safety lamp before and after each shot, as required by state law and the federal code. In the in-

terest of safety, and to comply with the state law and the federal code, the state inspection department introduced an instantaneous multiple-shooting system under which all shots are fired simultaneously. In addition, the state department also put into use what is known as the "Evans fog gun."

The fog gun is a simple device that cannot clog and provides a fine mist at the face during shooting. As shown in the accompanying illustrations, it consists of a piece of 3/4-in. pipe tapped about midway of its length for the attachment of a 1/4-in. pipe. Water is admitted to the gun through the 1/4-in. pipe and compressed air at one end of the 3/4-in. pipe. The discharge end of the gun is belled out so that the fog will cover the desired area.

The usual requirements of the state law and the federal code governing rock dusting and wetting

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TWO VIEWS of the fog gun set up for demonstration. The right shows the fog produced.

down are complied with. The shots are fired electrically, all at the same time, with a permissible blasting battery. After the shots are wired up, and before firing, the fog gun is connected to the water and compressed-air lines and the valves opened. The result is a dense, wet fog that completely fills the place. Then the shots are fired.

Bellingham No. 1 mine, served by the Great Northern R.R., is operated through three rock slopes. The mine is developed in the No. 1 coal bed of the Bellingham series. Average thickness is $12\frac{1}{2}$ ft., and the bed dips 7 to 10 deg. southwest. Mining is by the room-and-pillar method. However, the room pillars are not extracted and from 3 to 4 ft. of coal in the bottom is left in place. The coal bed contains bands of bony coal, clay and rock.

The mine is classed as gaseous by the Division of Safety, Department of Labor and Industries, State of Washington. Water is sprayed in the working places, on the loaded trips and on the roadways. All places are rock-dusted to within 80 ft. of the working faces. An average of 143 men is employed at the mine and the average production, one shift per day, is 650 tons. The mine operates five days per week.

A permissible explosive is used exclusively for breaking down the coal. The electric detonators are Atlas No. 6 instantaneous type, with 6-ft. leg wires (iron) and metal-plate shunts.

Entry headings are driven 9 ft. wide on 40-ft. centers and the distance between each entry, made up of two headings each, is 500 ft. Rooms are driven 20 ft. wide on

50-ft. centers up the pitch to distances of 500 ft. or more. Crosscuts are driven on approximately 60-ft. centers and are staggered on opposite sides of the room, making the distance from the last crosscut to the face 30 ft.

The coal usually is shot off the solid. However, half the face is kept 4 to 5 ft. in advance so that a free face is available when the other half is shot. At times, the miner will shear the face with a pick along one rib, the shear opening being 5 to 6 ft. deep and 2 to $2\frac{1}{2}$ ft. wide.

Shot holes are drilled with hand-held jackhammer drills. The holes are $1\frac{3}{4}$ in. in diameter and range up to 6 ft. in depth. The number and location of the holes depend upon the width and condition of the place, upon whether or not the place has been sheared and upon the judgment of the individual miners. About seven holes are required for half of a 20-ft.-wide room face, six for a crosscut and from 6 to 14 in a heading face, depending upon whether the heading face has been sheared or not.

The usual charge per hole is 3 to 4 sticks for the cut shots, four sticks for the lifters and one or two sticks for the top and rib shots. The primer stick usually is placed in the back of the hole with the detonator pointing toward the bulk of the charge. The charges are stemmed with clay in paper bags, the dummies being made near the working face.

Three certified shotfirers are employed and they visit the working faces two or three times per shift to fire the shots the miners have prepared. Each shotfirer is equipped

with a permissible flame safety lamp and a permissible single-shot magneto-type blasting unit. During tests with multiple shooting, a 10-shot Atlas No. 2 blaster was used. The shooting cables are No. 14 or No. 12 well-insulated braided-type copper wire or No. 14 double-conductor (duplex) wire.

A fog gun is installed on a prop near the face of each working place and it is turned on before each charge, or series of charges, is fired. Length of the $\frac{3}{4}$ -in. pipe comprising the main member is 19 in., with the discharge end slightly flared. A steel handle is welded to the pipe, permitting nailing the fog gun to the prop. A $\frac{1}{4}$ -in. pipe enters the nozzle at an angle of 45 deg. through a hole opposite the handle. The small pipe is made secure by spot welding. The large pipe has an air-hose fitting on the intake end and the small pipe is bushed to accommodate a regular garden-hose connector.

The fog guns usually are installed $5\frac{1}{2}$ to 7 ft. above the mine floor and within 15 to 20 ft. of the face. The combination of air and water produces an effective fog for allaying dust and reducing the concentration of gas.

Before the introduction of fog guns at the face, single-shot blasting was used exclusively. Shotfirers, after firing several holes, were unable to make satisfactory tests for methane at the working faces because of the coal and rock dust thrown into the air. Also, they had to breathe an atmosphere containing excessive concentrations of dust and fumes. For these reasons, shotfirers made examinations for gas only after every third shot, which

Table I—Air-Analysis Results, Single-Shot and Multiple Shooting,
With and Without Use of Fog

	10 South Back Heading, 5,626 C.F.M., 59 deg. F., 88 Percent Rel. Hum.			10 North Air Course 6,000 C.F.M., 59 deg. F., 88 Percent Rel. Hum.			Room 18, 10 South, 4,500 C.F.M., 59 deg. F., 88 Percent Rel. Hum.		
	Single-Shot, 12 Sticks, No Fog		Multiple, 9 Sticks, No Fog	Single-Shot, 16 Sticks, With Fog		Multiple, 12 Sticks, With Fog	Single-Shot, 10½ Sticks, With Fog		Multiple, 8½ Sticks, With Fog
	3rd Shot	6th Shot		2nd Shot	4th Shot		2nd Shot	4th Shot	
Carbon dioxide ...	0.12	0.10	0.03	0.20	0.22	0.17	0.13	0.12	0.10
Oxygen	20.87	20.83	20.92	20.68	20.75	20.80	20.87	20.85	20.88
Carbon monoxide .	0.04	0.03	—0.01	0.05	0.05	0.04	0.04	0.03	0.01
Methane	0.12	0.15	0.03	0.21	0.27	0.24	0.14	0.16	0.11
Nitrogen	78.85	78.89	79.01	78.86	78.71	78.75	78.82	78.84	78.90
Oxides of Nitrogen (P.P.M.)	16	11	0	11	0	0	20	14	0
Hydrogen sulphide	Trace	0.002	Trace	0	0	0	Trace	Trace	0
Dust, millions of particles per cubic foot	280	95	86	18	9	11	25	170	5

was contrary to the federal mine safety code.

Experiments were conducted and dust and fume samples were taken with both single-shot and multiple shooting and with and without the fog gun in operation to determine if conditions could be alleviated sufficiently to enable the shotfirers to conform to the federal mine-safety code and to provide air of a more-breathable quality.

Samples collected during single-shot blasting normally were taken after half the shots were fired and again after the last shot was set off. For instance, if seven holes were to be fired, a series of samples were collected after the fourth and seventh shots. With multiple shooting, the samples were collected as soon as the shotfirer returned to the face to examine for gas. Results of the analysis of the air samples are summarized in Table I.

Dust and Gases Cut

Analysis of the air in the three working faces selected for the tests, and under as near identical conditions as it was possible to provide, indicate that gases from the explosive are less with multiple than with single-shot blasting. The results also prove conclusively the benefits provided by the fog gun. From the health aspect, the two most significant gases are carbon monoxide and oxides of nitrogen. In 10 South back heading, the percentage of carbon monoxide was reduced from an average of 0.035 with single-shot blasting to less than 0.01 with multiple shooting. At the same location, the oxides of nitrogen were reduced from an av-

erage of 14 parts per million to zero. In 10 North air course, carbon monoxide was reduced from 0.05 percent with single shooting to 0.04 with multiple shooting, while the oxides of nitrogen were reduced from an average of 5.5 parts per million to zero.

The benefits of the use of the fog gun are reflected in the results obtained in Room 18, 10 South. Without the fog, the carbon monoxide averaged 0.035 percent. With fog, the concentration was 0.01 percent. This reduction can be attributed to the increased ventilation induced at the face by the fog. At the same location, the oxides of nitrogen were reduced from an average of 17 parts per million to zero, attributable to the high solubility of oxides of nitrogen in water.

Dust-count results indicate that more dust is thrown into suspension during single-shot blasting as compared to multiple shooting. "Midget-impinger" dust samples were collected in the same manner as gas samples. In 10 South back heading, without fog, multiple shooting resulted in a concentration of 86 million particles per cubic foot. The average of two samples during single-shot blasting was 188 million. In 10 North air course, with the fog gun operating, multiple shooting resulted in 11 million particles per cubic foot, against an average of 14 million with single-shot blasting. The benefits of the fog gun are shown definitely by the results in Room 18, 10 South. Without fog, the average dust count was 98 million, compared to 5 million with the fog gun operating.

The variation in dust counts be-

tween the middle and last shots with single-shot blasting results from the burden per hole. The greater the burden, the smaller the quantity of fines produced, thus resulting in a lower concentration of dust in the air. The reduction in dust in the air during multiple blasting probably is due to the coal face being broken down as a unit, with a resultant increase in the percentage of big pieces of coal and a smaller percentage of fines.

Multiple Shooting Proves Value

It was noted during the tests that the individual miner was more precise in selecting the position and angle of the shot holes, placing the maximum burden on each, when drilling for multiple shooting. Less powder was used during multiple shooting to obtain the same tonnage of coal. Multiple shooting also resulted in a better fall for loading, as it was more compact and had sufficient lumps for car topping.

The tests on single-shot and multiple shooting with and without the fog gun indicate the following conclusions, insofar as this mine is concerned:

1. Multiple shooting generates less noxious gases than single-shot blasting.
2. Multiple shooting throws less dust into the air than single-shot shooting.
3. Less powder is required to break down a face with multiple shooting.
4. The fog gun is decidedly helpful in reducing concentrations of both gases and dust during shooting operations.



EDNA STRIPPING LOOKING NORTHWARD down Trout Creek Valley toward the main Park Range. The dragline is working at its new location at the lower end. Coal at the right is crop coal too soft for loading.

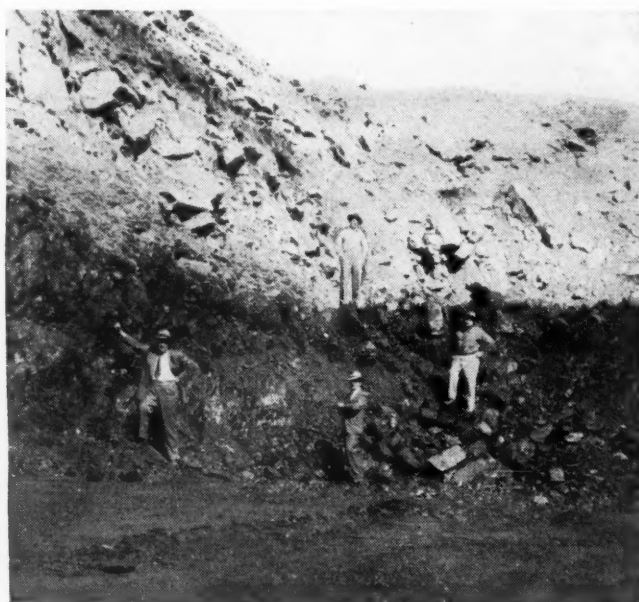
Mountain-Top Stripping

Edna Open-Pit Operation Required Solving Problems Not Encountered at Lower Elevations—Winter Temperatures Range Up to 30-Below—Terracing Necessary in Moving Dragline on Pitch—Six Wheel Drive Trucks a Major Factor in Successful Production

ALONG with the distinction of operating one of the highest strip mines in the United States, if not in the world, the Edna Coal Co., Oak Creek, Colo., also has the task of solving a few problems not found in stripping at lower elevations. These include 30-below-zero temperatures, snow-drifts up to 5 ft. in



SHOOTING OVERBURDEN is carefully regulated to facilitate stripping at Edna. Some 2,700 lb. of explosive is used per lift approximately 60 to 75 ft. wide and 60 to 70 ft. long.



THE EDNA COAL SEAM. Manager L. M. Cooley is standing on the top, with Nels A. Swenson at the left, V. B. Smith, center, and C. G. Cooley, the fourth partner, right.



EDNA WALKING DRAGLINE, with 135-ft. boom and 3-cu.yd. bucket, at work. It operates from terraces made in or on the sloping surface. In the background are the characteristic quaking aspens and cottonwoods.

depth, freezing of 4 to 8 ft. of top soil so that it refuses to break up except in giant slabs, thawing of the frost in pit runways and roads during the spring to form morasses not hub deep but up to the frames of the trucks, handling of stripping units on an inclined surface turned into a skating rink by freezing, outside work in 30- to 40-mile icy winds and haulage over the heavy grades characterizing mountain operation.

Proof that these and other problems of stripping coal on top of the Rocky Mountains can be solved lies in the fact that the Edna Coal Co. has brought daily capacity up a maximum of 1,600 tons for single-shift winter operation in a little over two years. The property was opened in September, 1945, by Nels A. Swenson, who also operates the Nugget Coal Co., Hanna, Wyo., and V. B. Smith, Denver, doing business as the S. & S. Coal Co. The operation was reorganized in January, 1946, as the Edna Coal Co., during which the old partnership was enlarged to bring in C. G. and L. M. Cooley, of Cooley Bros., Denver, long experienced in gold dredging and other open-pit mining in the West and Middlewest. L. M. Cooley is now the managing partner in full charge of operation and sales. M. M. Moser, formerly with The United Electric Coal Cos., in Illinois, is general superintendent. V. C. Wright is pit foreman and L. E. Welshans is in charge of the head-

quarters office located in Denver.

Preparation at Edna includes both screening and washing in a plant with a capacity of 1,600 tons per shift. The main screening plant makes all the standard Routt County (Colo.) sizes, including: 8-in. lump, 3-in. lump, 8x3-in. grate, $1\frac{1}{4}$ x $\frac{1}{2}$ -in. pea and $1\frac{1}{4}$ -in. slack. Separation of the fine sizes is done on a 3x6-ft. Link-Belt vibrator and a 36x54 Link-Belt main crusher is installed, powered by a 100-hp. G.E. motor.

To Enlarge Washing Facilities

All sizes can be oil treated and the nut is washed. Loading can be into either hopper or box cars, using Ottumwa and Manierre loaders (one each). A separate plant includes a Jeffrey washing unit with a capacity of 75 tons per hour. It prepares 3x $1\frac{1}{4}$ -in. nut coal and is one of the three washing plants in the field. A new preparation plant capable of washing everything from 6 in. down is being designed, and with its installation it is planned to increase production to 200,000 tons per year. The Colorado Fuel & Iron Corp. is exclusive sales agent and the product is marketed as "Oak Hills Edna" coal.

Edna production comes from a typical Routt County bituminous seam, varying in thickness from 6 to 11 ft. and lying on top of a northward-sloping spur of the Park Range, some 20 miles west of the

Continental Divide. The preparation plant is on Oak Creek at the foot of the eastern slope of the mountain spur and is served by the Denver & Salt Lake R.R., now a part of the Denver & Rio Grande system.

The coal seam operated by Edna is, as noted, a member of the Routt County group and is known throughout the trade territory as the Wadge measure. Two other principal operators of the district also mine from the Wadge. Identification of the five workable seams of the district is facilitated by correlation with the Trout Creek and Twenty-mile sandstones, often appearing as escarpments in the generally saw-toothed cross-sections of the district in which natural drainage channels are overshadowed by bluffs, with steep slopes from the summit toward the next creek. Coal measures lie roughly parallel to these sandstone-supported slopes.

The seam now being recovered outcrops at the top of the mountain and the initial opening was made there. During the summer of 1947, however, the equipment was moved some 2,700 ft. down the spur and is working away from the summit, making a box cut to increase the working face to some 7,000 ft. in length.

The average dip of the coal is 11 percent. The surface dips slightly more, or about 13 percent, which accounts for more shallow cover at the lower, or northern, end of the



LOADING COAL into a 6x6 truck with 11-cu.yd. body. Large lumps are a distinguishing feature of the product. Trucks average 40 minutes per round trip over the 3.9-mile one-way haul.



L. M. Cooley, managing partner, with son, Tommy.

property. The deepest cover tackled so far is 58 ft., in the new work toward the lower end where the machine was worked somewhat cross-contour on a curve. Average burden over the present stripping area consists of 53 ft. of hard sandstone, 18 in. of coal, 15 to 20 ft. of decomposed sandstone and 15 ft. of top soil.

Dozer Clears Timber Growth

Stripping at the Edna is handled by a 2,300-volt electrically powered Bucyrus-Monighan 5-W walking dragline with 135-ft. boom and 4-cu. yd. bucket. Equipment includes Westinghouse motors and controllers, Ward-Leonard control, Leschen ropes and a Model ADS 1002 Gardner-Denver compressor. The dragline is occasionally helped out by the loading shovel, a Northwest Model 6 unit with 1½ cu. yd. dipper, powered by a Murphy diesel engine. The surface is heavily overgrown with the characteristic cottonwood and aspen up to 5 in. or so in diameter. Because the wood is soft and brittle, however, clearing is easy. A Caterpillar D-8 tractor with LeTourneau angledozer merely butts the "quakies" and cottonwoods down and rolls them into windrows where they are burned or covered with spoil. The same angledozer unit is, of course, used for coal cleaning and other general pit work.

Because of the pitch of the surface, working the dragline introduces the problem of moving up or down. Since the dragline must

stand level during operation, it is necessary to make a series of terraces for working platforms and, of course, to move from one or the other either up or down.

When operation is on an uphill basis, the terraces are made as the dragline works up the pitch. In moving down from the earlier location at the upper end of the property, however, coal was uncovered along a box cut up and down one side of the spur. To take a lift, the dragline dumped spoil down the pitch behind it to form a level terrace on which to operate. Naturally, if terrace building was continued indefinitely, the dragline eventually would have been so high in the air as not to be able to operate. Consequently, it was necessary to establish a new terrace at intervals and move down on it from the old. This was done by angling the terrace slightly down the pitch and feathering it out back from the wall of the box cut, permitting the dragline to walk around the end of the old terrace, on to the new one and back over to the edge of the box cut to begin a new lift.

The process was further eased by putting the loading shovel on the bank when coal loading was not going on. Casting into the old box cut, the loading shovel would take up to 10 to 15 ft. of the top material back to 40 to 50 ft. from the edge of the box cut, thus doing a large part of the work of forming a new terrace, in addition to playing its part in increasing the rate of coal uncovering.

In present uphill stripping the

dragline works on terraces made by cutting or filling. As it moves along on a cut 60 to 75 ft. wide, it swings from time to time and either cuts or fills ahead to establish its footing for the next lift. Filling is done primarily at the end of a cut to raise the unit enough so that it can walk up to the next terrace easily in preparation for making the next cut. In operation in the main overburden the dragline first makes a narrow "key cut" along the line of the highwall, which facilitates removal of the remaining material.

Winter Moves a Problem

Maneuvering the dragline when the surface is frozen is something of a problem in avoiding disastrous slides. When it has been necessary to let the dragline down the 13-percent pitch when the ground has been frozen in the past, it sometimes has been necessary to snub it with cables to the tractor and road patrol, these machines advancing as the dragline steps, but holding firmly onto the cables between steps. Experience has shown the dragline is most likely to begin sliding as the tub sets down on the ground and as the shoes rise for the next step. Dragline operators soon lose their taste for sledding on this 325,000-lb. machine. As an additional precaution when working over a highwall on frozen ground, the dragline base has been fitted with wedged shaped bars, welded radially, as grouser.

Shooting at Edna is based on drilling lifts ahead under the drag-



LOADED TRUCKS traveling down the access road to the county highway. The traffic is left hand to keep the loads off the shoulder. Maximum grade on this access road is 5 percent.

line from the face of the new cut, rather than sideways into the high-wall. Cuts, as noted, are 60 to 75 ft. wide. When the dragline has advanced 60 to 70 ft. and has cleaned up the face of the cut, the overburden drilling crew drills 5½-in.-diameter horizontal holes under the dragline and parallel to line of advance. The holes are spaced 9 to 11 ft. apart. These holes are loaded with dynamite in 4½x16-in. sticks—65 percent strength in the key cut and 45 percent in the remainder. During such drilling and shooting the dragline is kept busy removing the top 15 to 20 ft. of the next cut.

A rubber-mounted Hardsocg Model E-9 drill with 3¼x3¼ Wisconsin gasoline engine drills the 66-ft.-deep holes without difficulty. An average of 9.3 ft. of hole is drilled, loaded and shot per man-hour. Ordinarily, about 20 to 25 ft. of top material may be removed without shooting. The usual loading for the remaining 30 to 35 ft. is 2,700 lb., equally divided in the holes.

Surfaces Freezes 4 to 8 Ft.

In winter, as noted, the surface freezes solid to a depth of 4 to 8 ft. When the overburden is shot, this surface layer tends to lift up in very large unbroken slabs. Handling varies. Usually the dragline tries to hook the slabs under an edge and pull them to the edge of the bank so they can be slid into the pit. Or, they may be lifted and dropped to break them up into manageable pieces. Occasionally, it is necessary to drill and shoot the

slabs to break them up. This is especially true when the dragline must dig into the icy layer in making a terrace for future operation.

Since the bottom is hard and it is easier to load the full width of a cut, the coal is completely loaded out to the highwall, the trucks operating on the bottom and going out through runways up the bank at strategic spots. The coal is drilled to the underlying fireclay by a gasoline-powered vertical auger making 2-in. holes. Before loading, a foot or so of stemming is replaced in the bottom.

Since the pitch makes it possible to keep the pits self-draining and since rainfall is not too common, water is not too much of a problem in either stripping or loading. Melting snow in the spring is the biggest source of water, but this period is rather short and occurs at a time when demand normally begins to slack off.

Snow in the winter is, surprisingly enough, not too much of a problem in either haulage or pit operation, since with the equipment operating most of the time, it is packed down or moved out of the way as it falls with the help of the bulldozers and road-maintenance equipment on hand. Total snowfall in this district averages 75 in. and, while it is not too great a problem, careful planning is necessary to insure its disposal. Trees are cleared for a considerable distance from the roadways to prevent drifting, road patrols sweep roads hours before coal haulage starts and are kept continuously busy during days of

heavy snowfall. Ditches must be deepened for snow disposal to prevent the roadway itself acting as a ditch.

Haulage at Edna is handled by International 6x6 Model M-5H-6 trucks. Although rated at 2½ tons, the end-dump bodies on these trucks have been built up to a capacity of 11 cu. yd. The all-wheel drive provided by these trucks and their ability to stand the gaff are, in fact, credited with a large part of the success of the Edna operation, along with extremely careful maintenance. Good maintenance keeps them in condition to take the heavy grades and heavy loads at a good operating speed. Brakes are a special item for attention. Keeping them, as well as the rest of the truck, in good condition raises the confidence of the drivers and keeps the coal rolling.

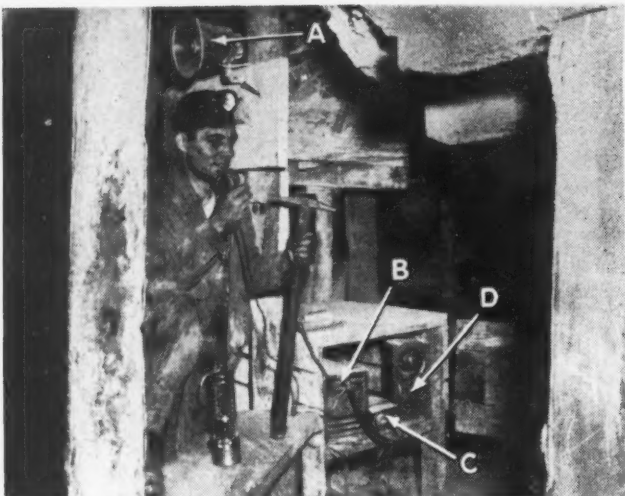
Pit Ramps on 15-Percent Grades

Ten of these International trucks have averaged 1,200 tons per shift over a 3.9-mile haul in the middle of the winter or during the period of spring thaws. Ramps out of the pit necessarily must be made on grades as steep as 15 percent or more, and it has not been uncommon for a truck, fully loaded, to pull out in mud up to differentials with the help of the traction provided by the six-wheel drive and a low of 10 gears forward, providing speeds of 2 to 35 m.p.h.

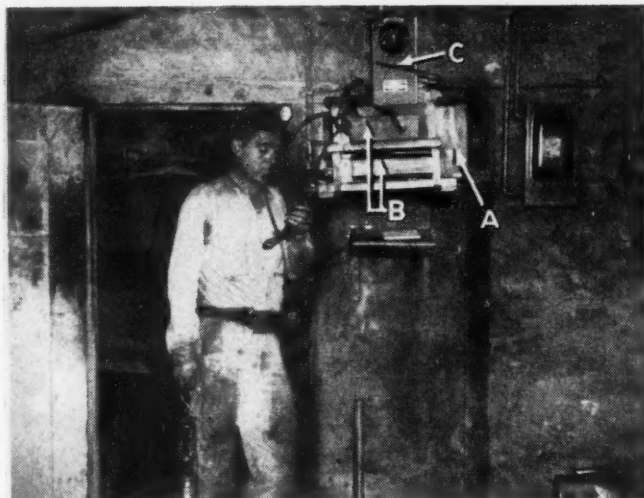
From the pit the trucks run a distance of 1.5 miles on a company road, with a maximum downgrade of 5 percent to the junction with the county highway. From this junction the grade is up (maximum 5 percent) to the top of the mountain and then down, with a maximum of 6 percent, to the dump at the preparation plant. Under normal circumstances the round-trip time is 40 min. Roads are kept in condition with a Caterpillar Model 12 road patrol.

Although performance has been good considering the distances and grades involved, plans already have been made for reducing the severity of the haulage problem at Edna. This involves the installation of a lowering belt down the east side of the mountain to the tippie and relocation of the haulage road from the pit to lead it up the spur and across the top of the mountain to a dump hopper on the east side at the head of the belt. Grades will be materially reduced and operation over county highways eliminated with a saving all around, including truck and road maintenance.

"RADIO" SYSTEM ON THE JOB AT TWO MINES



A STATIONARY POWER set in a mining section is used by John H. Knea, section foreman, to call the mine foreman. Principal parts of the equipment are the speaker, "A," trans-receiver, "B," resistor, "C," and the self-contained battery-operated emergency set, "D," kept near the resistor to counteract dampness.



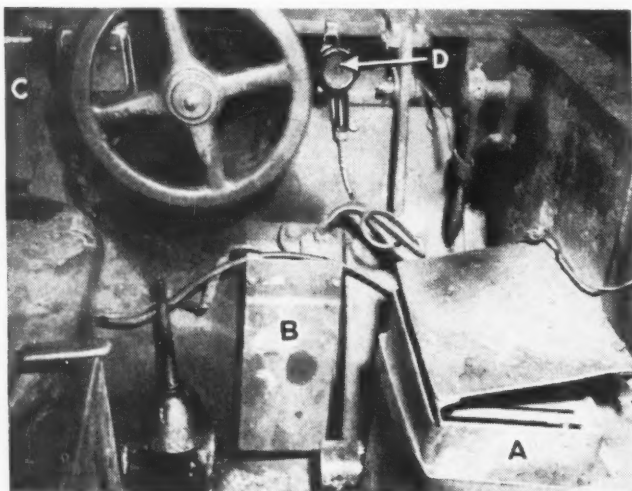
THE SPEAKER for the stationary set in the electric shop at No. 4 mine, by which Ray Cox, mine foreman, talks to a section foreman, is placed just outside the door so that it can be heard at the shaft bottom 50 ft. away. The emergency set, "C," is kept on top of the trans-receiver, "A," and resistor, "B," of the power set.



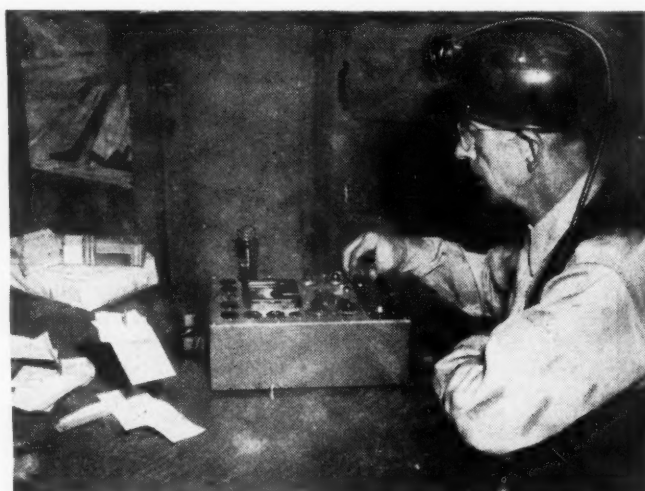
IN THE SURFACE OFFICE at No. 3 mine, Ray Ingole, mine foreman, calls the motorman of a locomotive en route to the shaft bottom. The emergency set, at the right of the loud speaker, is self-contained, with speaker, microphone and dry cells for power.



FROM HIS OFFICE near the top of the shaft at No. 4 mine, V. L. Hancock, inside superintendent of both mines, talks over one of the extension sets to a section station in No. 3 mine. An emergency set is at the right next to the wall.



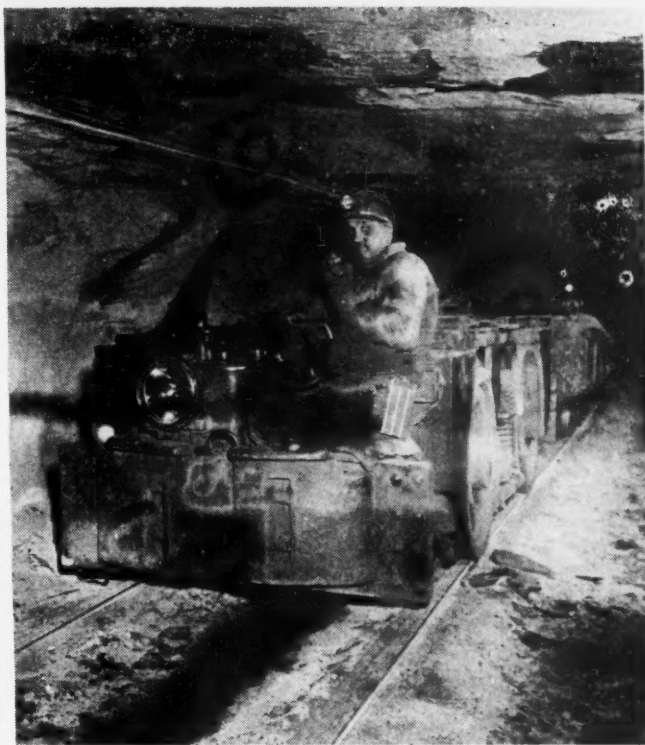
THE TROLLEYPHONE UNIT as installed in the cab of a 13-ton locomotive consists of the trans-receiver, "A," the resistor, "B," the speaker, "C," and the microphone, "D," which hangs on a hook within easy reach of the motorman.



A TUBE thought to be defective is tested by V. L. Hancock, inside superintendent, on a conventional tube tester, the only maintenance equipment purchased to date. Tubes used in the sets are standard radio types available locally.



FROM AN 8-TON main-line locomotive in No. 4 mine, Orville Taylor uses the microphone to talk to another motorman.



A CALL TO THE DISPATCHER is made by John Cherry, operating a 13-ton locomotive in No. 3 mine.

Trolleyphones at Lake Superior

Battery Sets for Emergencies and Use When the Power Fails Round Out "Radio" Communication Facilities at Lake Superior Mines—Sets Installed on Locomotives, in Working Sections and in Mine Offices

A MINE-COMMUNICATION SYSTEM that combines—without the conventional telephone wiring—the mobility of two-way talk with moving locomotives and the safety features of a permanent telephone system has recently been completed at the Lake Superior Nos. 3 and 4 mines of the Lake Superior Coal Co., Superior, McDowell County, W. Va. The 16 trolley-powered sets, including seven on main-line haulage locomotives, in use since December, 1946, have performed so well and made efficient dispatching and supervision so much easier that mine officials often wonder how they ever got along without them. Now, with the recent addition of battery-operated emergency sets to the system, instant communication between any of the nine permanent stations still is available should the power for the trolley sets be cut off for any reason.

Both mines are shaft operations working contiguous seams 65 ft. apart. Entries in the two mines are one above the other, while the pillar lines of retreating sections are kept 100 to 150 ft. apart in columnar relation. No. 3 mine, producing 1,300 tons per single-shift day, mines the lower seam (Pocahontas No. 3) 5 ft. thick. No. 4 mine, producing 1,100 tons daily, mines the upper seam (Pocahontas No. 4) 4 ft. thick. Both mines are classed as gassy.

Separate Shafts Service Mines

Hoisting shafts for the two mines are in a valley, 2,000 ft. apart. The shaft at No. 4 mine is 160 ft. deep, while that at No. 3 is 250 ft. Each mine is served by a hoisting shaft and an air shaft, which also serves for handling men. No shaft nor slope connections exist

between the mines. Hand loading into mine cars is the mining method in both operations.

Until a few years ago, main-line haulage distances were short, comparatively speaking, and both mines were operated without telephones. After installation of telephones of the ordinary wired type was decided upon, deliveries of the wire and instruments were found to be slow. The telephones were obtained but their installation was held up awaiting wire. Then, about a year ago, company officials heard of the "Femco trolleyphones" operating successfully in Pando No. 7 mine in that same county (*Coal Age*, November, 1946, p. 98).

Following study of the system, officials decided to install the "wireless" telephones in the Lake Superior mines and sell the unused wired telephones. This "Femco Trolleyphone" system, called "the radio" by the miners, is manufactured by the Farmers Engineering & Mfg. Co., Pittsburgh, and distributed by the Dixie Appliance Co., Bluefield, W. Va.

In the operation of the sets, the voice is transmitted by a frequency-modulated carrier current traveling over the d.c. trolley and feeder wires. Use of frequency modulation

instead of amplitude modulation greatly reduces interference and conversation can be maintained in spite of leaky insulators, sparking brushes and arcs. It is not unusual to be able to talk over a trolley wire that has an open section switch.

Emergency Sets Self-Contained

The "Femco trolleyphones" now are made in two types: the standard set, powered from the d.c. system; and the emergency or battery set, intended for use only in emergencies when the mine power is off. The power set consists of a "trans-receiver," resistor, speaker and microphone. The trans-receiver is 10 $\frac{1}{4}$ in. high, 7 in. wide, and 19 $\frac{1}{4}$ in. long; the resistor 3 $\frac{1}{2}$ x5 $\frac{3}{4}$ x15 $\frac{3}{4}$ in.; and the speaker 6 $\frac{1}{2}$ x4x7 $\frac{3}{4}$ in. All parts of the emergency set are contained in one case, 16 in. high, 8 in. wide and 8 in. long. The systems are "common speaking," with words spoken into any of the microphones emanating from speakers of all the other sets.

An extension station, consisting only of a speaker and microphone, can be installed within a reasonable wiring distance of a standard set. An extension reduces the cost of a station or facilitates installation where there is no carrier power line between the standard set and the location of the needed extension.

Seven Locomotives Equipped

At the Lake Superior No. 3 mine, power sets are installed on the four main-haulage trolley locomotives, four sets are in stationary service in the four mining sections, one is in the dispatcher's office at the shaft bottom and there is an extension in the mine office on the surface near the top of the shaft. Emergency battery sets are installed adjacent to the power sets in the four mining sections, to the power set in the shaft-bottom office and to the extension in the surface office. The emergency sets have been placed close to the trans-receivers and their resistors so that their heat will help keep the battery sets dry.

The installation in No. 4 mine is similar, except that there are only three main-haulage locomotives and three mining sections. Maximum main-line haulage distances in both mines now are about 1 $\frac{3}{4}$ miles. A rotary-converter substation supplies 275-volt d.c. power to No. 3 mine and a motor-generator to No. 4. Normally, the d.c. systems of the two mines are not paralleled.

To use a power set, whether stationary or on a locomotive, a man grasps the microphone, presses a button on it and calls for the person, locomotive or location he desires. To listen, he releases the button. With the "common-talking" feature and the use of loud speakers, it is easier to locate a man in or about the mine than it would be with ordinary wired telephones, since anyone near a station hears all the calls and can inform the person called should he happen to see him. Motormen, especially, are likely to know where certain mine officials may be when called.

The dispatcher in No. 3 mine also acts as a bottom boss to supervise caging and hoisting. In No. 4 mine, the main-haulage motormen do their own dispatching.

All Calls Heard in Both Mines

Although the d.c. systems of the two mines are not interconnected, the sound originating from any microphone in either mine may be heard equally clearly on all speakers of both mines. Whether the carrier current crosses by the a.c. power system supplying the substations, by induction or because of the small interval between the mines, has not been explained.

At first, it was thought that the cross talk between mines would be a disadvantage. Now, it is considered an advantage, particularly since direct supervision of both mines is under one man, V. L. Hancock, inside superintendent. From a telephone set in a section in either mine he can communicate without delay with any point in the other mine. Also, he can listen in at any set and hear what is going on in both mines. All calls and the replies include identification of the mine, for example: "Calling No. 3 bottom," and the answer, "This is No. 3 bottom."

Battery-Set Operation Simple

To use an emergency set, a toggle switch on the front of the set is closed and a press-to-talk button is operated similarly to that of the power set as the conversation proceeds. The speaker and microphone are built into one compact box, which also holds the batteries and tubes. A small neon lamp flashes on and off to indicate that the set is working when one speaks into it.

The men are not inclined to use the emergency set when the power set is operative, because the battery set also is coupled to the trolley line

and, when the power is still on, considerable noise may be heard. This helps to discourage unnecessary tampering with the battery-set switch and therefore reduces the possibility of its being left on and the batteries run down. Life of the three small square "B" batteries powering the emergency set is estimated at 18 months, but the mine officials plan to renew them at least once a year for safety.

Present cost of a power set, consisting of trans-receiver, resistor, speaker and microphone installed on a locomotive, is reported to be about \$600. Emergency sets cost somewhat less than \$100 each, it is understood.

Current Drain Small

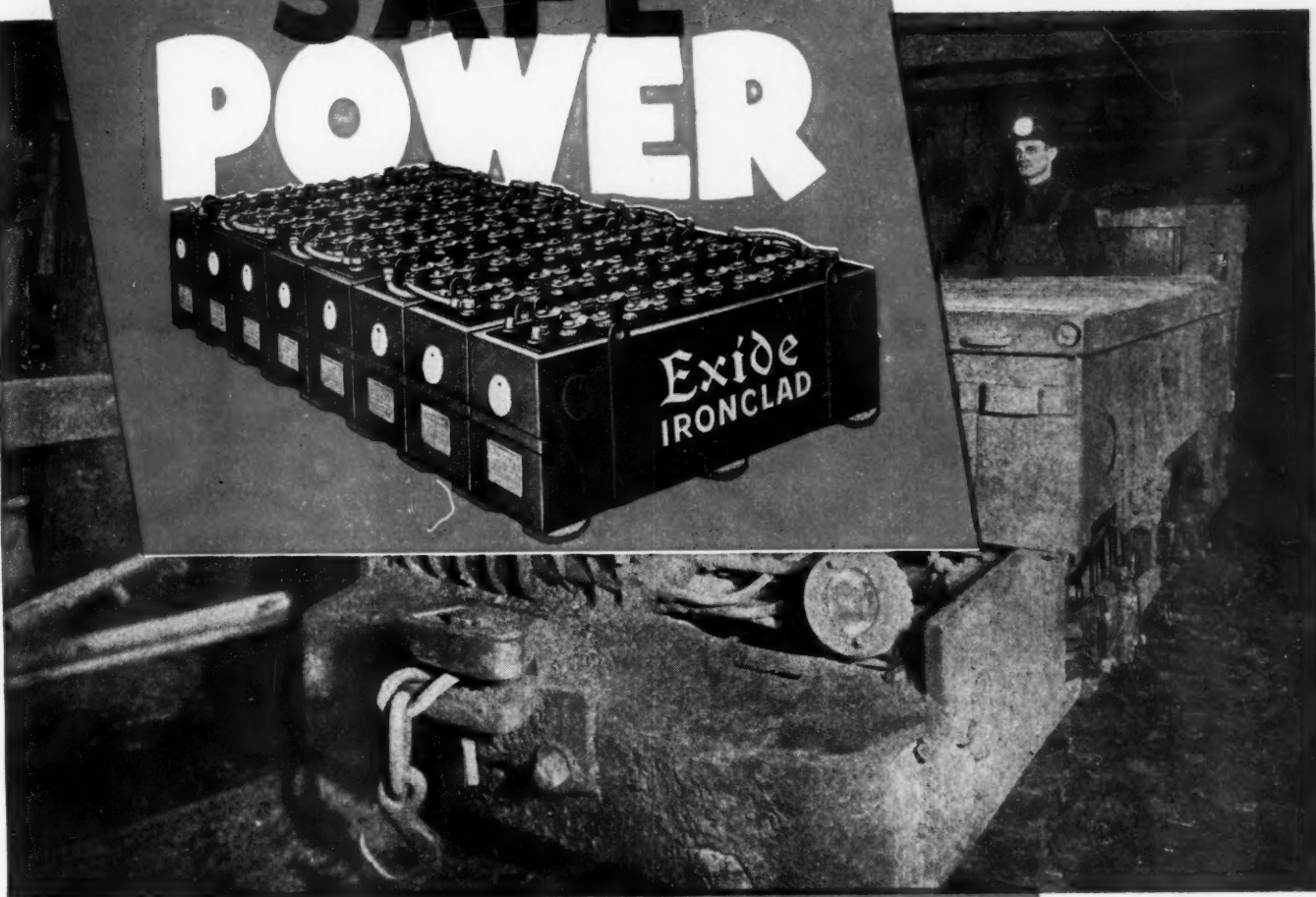
The current drain from the d.c. power line is about 1 amp. per set, according to the manufacturer, and the signal output is around 50 watts. The usual line-voltage fluctuations do not affect the operation. Frequency is about 100 kilocycles, which is far below the radio broadcast band but considerably above the audible voice range. A squelch circuit keeps noises from being heard on any speaker until the receiver is engaged by someone operating the microphone button on any of the sets. Noise, no matter how loud, however, cannot blast through at a level above that of the voice.

Standard Radio-Type Tubes Used

The 14 tubes used in the power set, as well as the tubes in the emergency sets, are all standard radio types that can be purchased locally. The 90-day-guarantee period on the sets also includes the tubes. In the Lake Superior mines, even on locomotives where vibration is severe, the inconvenience and expense from tube failures have been minor. The only maintenance tool the company has purchased for the trolleyphones is a Philco Model 7050 tube tester, which is kept at No. 4 mine in the office of the inside superintendent at the top of the shaft.

B. C. Hylton, Superior, is general superintendent, and P. W. Damon, chief engineer, of the Lake Superior Coal Co. Frank Harris, Cannelton, Kanawha County, W. Va., is vice president and general manager of the company and also of the Cannelton Coal & Coke Co., both of which are controlled by the Algoma Steel Corp., of Canada. Ray Ingole is foreman at No. 3 mine, Ray Cox, foreman at No. 4, and W. E. Porter is chief electrician for both mines.

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The Foremen's Forum

Improving Power Voltage—How Foremen Can Help Keep Equipment on the Job

The electrical demand meter's reading provides an accurate check on the pulse of a mechanized operation. Whenever machines are working, regardless of numbers, that work is being registered by the demand meter. Now, you may be asking yourself—What connection is there between the demand meter in the outdoor substation and my job underground? Well, here's the connection. When, and how hard your machines work, helps to determine that demand reading.

It used to be that mining companies were extremely conscious of the demand charge, for it was a variable item on the cost statement which they could point to. They would stop hoisting coal for short periods just to control the demand. Now, many operators realize that electricity is the cheapest servant around the mine. Instead of fearing the demand charge, the alert operator now worries about operational delays. He pays the demand charge, whatever it is, for he is convinced that it is the interruptions in production that really send costs soaring.

Avoiding Peak Loads

Everyone knows that nothing stops an operation more quickly and more completely than a power interruption. Here's where you can help. By keeping the machines on your section operating on schedule—running along at a clocklike gait—you can keep the shift-long demand for your section at a reasonably low figure. It is when things get out of step—gang up—that load peaks touch new highs. Moreover, these sudden peaks lead to power outages at many operations where transformer banks and substation sets, at best, are taxed to capacity. Therefore, through diligent supervision of operations on their runs, foremen can exercise control over the over-all mine demand. Equalizing the demand peaks for the system results in improving the system's average voltage and helps substation capacity to be more effective.

It is the voltage and the power capacity backing it up that really puts the "push" or "drive" in mining machines. Each motor takes electrical energy from the wires and con-

verts it into mechanical energy at the motor shaft. "Torque," a measure of the turning force available at the shaft, is dependent upon the percent of normal or nameplate voltage that is applied at the terminals of the motor. Without good voltage a motor cannot develop its rated horsepower. Actually, the torque of an a.c. induction motor varies as the square of the voltage applied at the terminals. For example, with 100-percent voltage the motor will develop 100-percent or normal torque. Increasing the voltage 10 percent above normal permits the motor to develop $110 \times 110 \div 100$, or 121 percent, of its normal torque or rated horsepower. Decreasing the voltage to 10 percent below normal penalizes the motor and it can only develop $90 \times 90 \div 100$, or 81 percent, of its rated horsepower. Direct-current motors are affected by voltage variation in much the same way as induction motors. From the above examples it should be clear that if a motor has a hard job to do it must be provided with good voltage at its terminals.

A good foreman can often make a machine's work easier and thereby make it possible for it to use less power. For instance, through proper face preparation the work of a load-

ing machine can be made easier and its tonnage per shift increased. Because of improper or poor face preparation, loading machines often spend considerable time digging when they should be loading. Besides wasting precious production time and using up power, these loading machines are running up extravagant repair bills.

Keeping a full set of bits—in good condition and set to gage—in the cutter chain is important in cutting-machine work, and more especially, if the cutting is hard. Bugdusting equipment, available for some shortwall machines, is reported to reduce power consumption since the cuttings are not carried back into the kerf by the cutter chain.

Good Track a Factor

Good track is necessary if haulage delays are to be avoided in rail-equipped operations. A locomotive can throw a heavy load on a power system by trying to drag a derailed car or trip back through a switch. Maintaining the gage, raising the low rail joints, elevating the outside rail on the curves and keeping switches in good repair will help rail equipment stay on the track and hold power requirements at a minimum.

With everything apparently running smoothly, it is still possible to have a power failure from just too much load or a short circuit. In either event, sectionalizing will help to localize the trouble. Without sectionalizing equipment the entire mine can easily become involved in the power outage. When the power comes on again, or tries to come on, it is important for the operators of the machines to use some discretion in starting those machines. They cannot all get going at the same time for there just isn't enough substation capacity. Therefore, they must take turns in starting their units.

If each section foreman would set up a priority rule for sequence starting of the larger machines on his run after a power failure, some good could be accomplished. For example, the loading machines could be permitted to start first. Fifteen seconds later, gathering locomotives could move, if necessary. Then 15 seconds later, or 30 seconds after the power had been restored, the cutting machines would be permitted to work. Main-line locomotives could, if the entire mine had been affected by the outage, resume operations one minute

How You Can Help Improve Voltage in Your Section

1. Keep load peaks down through smoothing out operational delays.
2. Make the machine's work easier so it will use less power.
3. Establish a voluntary power-priority rule for starting machines after a power outage.
4. Insist upon timely and adequate lubrication of all mechanized units.
5. Check constantly for hot splices in machine cables.
6. Report broken bonds and loose power connections.
7. Make it convenient for the wiremen to keep their work caught up in the territory.

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after power had been restored, the last of the units to start again.

During an outage, many machine operators leave the controllers on the first point so they will know the instant that power is available. However, few realize that, with a full-automatic substation supplying power, this act, when multiplied by other operators doing the same thing, blocks a quick return of the power. After every power failure, the d.c.-reclosing apparatus at the substation measures the load on the station through a load-indicating-resistor unit before the d.c. circuit breaker is permitted to reclose. If the load indication is too high, because of a number of controllers being left in the on-position, power will be withheld until more of those controllers are turned to the off-position. Thus, a few machine operators might, in this manner, delay operations in a considerable area of the mine unnecessarily.

A foreman should check to see if his mechanical equipment is being lubricated properly and often enough. Lubrication helps to reduce friction, a great consumer of power. Friction slows down machines, calls for extra driving power, causes parts to wear and produces heat. In some instances, as in the contact between a locomotive wheel and the rail, or between the wheel and the brakeshoe, friction is an asset. But generally we are anxious to reduce its ill effects.

Cleanliness in the handling of lubricants is paramount. The application of the lubricants to the equipment should be the sole responsibility of one or more individuals, who after being properly instructed, can be trusted to do the job.

Power Wastage Indicated

Getting back to the power circuit, heat, as you know, is a sign of power being wasted. Whether it involves the trolley, a cable splice or the contacts of a feeder switch, the alert foreman will seek to eliminate it. He knows that power wasted along the circuit means less power available at the face. We are helpless to improve the inherent resistance of a copper wire or conductor but we can use more copper in the circuits and see that the connections are good.

Sparking rail joints also indicates where the power circuit is in trouble. When bonds get knocked off or cut in two, the splice bars try to carry the current. As these contacts are poor and the carrying capacity low the joints tend to heat. Often the heat dries out the roadbed in the vicinity of the joint, providing another means of detecting such joints. Poor joints on the negative or return-side (rail) of the power circuit are power robbers just as are poor connections on the positive side. The power comes from the substation and it has to get back—else it doesn't flow at all.

Lastly, a foreman can provide his

equipment with better power by co-operating with the wiremen. He can make it more convenient for them to keep their work caught up. Wiremen like to keep a jump ahead of the hounds by getting insulators up and by installing room jumpers where they are needed. Cooperation helps to get things done and the wiremen will welcome your help.

Tips on Handling "Soldiering" on the Job

With the miner's wage scale at a new high and his working day cut to seven hours, with only six hours or so at the working face, it is highly important that men work steadily and at a high level of productivity. In solving this problem, the foreman must play the leading role because (1) he knows what keeps his company going and what its policies are, (2) top management holds him responsible and gives him authority and (3) he is in close daily contact with miners on the job.

Lags in production, by and large, fall into two classes—those the foreman himself must take the blame for, in which case the solution depends on his honesty with himself and his determination to set things right; and those his workers can be blamed for, in which case he must call on his human-relations skill to bring production back to normal.

As for the first class, if timbers are not stacked in the right place at the right time, if spare parts are not kept close at hand, if the shuttle-car operator has to wait for the dispatcher to send cars in, workers quickly slack off. And if these things happen regularly, workers probably will begin to ask why they should worry about production if nobody else seems to care.

If haulageways are dirty, if bars and picks are carelessly thrown down and allowed to lie, if a working place is unnecessarily wet, then workers also will become slipshod. Bad air at the face, frequent breakdown of equipment, and poor power supply will discourage a crew that really wants to do a first-rate production job. If machines are not kept in good working condition, quality work will vanish and the best of miners will begin to "soldier" on the job.

Correcting poor productivity due to conditions like these demands two things of the foreman: (1) the honesty to admit that the fault is his and (2) quick action to set things right. The first may be harder to do than the second, because it is always easy to blame somebody else. But if the foreman takes the blame when he ought to, his men will respect him for his honesty and will feel better because the blame is not thrown their way.

To boost productivity and keep it high, the foreman should make care-

ful schedules for cutting, drilling, shooting, timbering and loading. He should get supplies in on time. He should see that haulageways and working places are kept clean and clear of obstructions. And he should work hand-in-glove with the machine-shop foreman, the electrician and the supply clerk to assure his men of a fair chance to do a fair day's work.

A good deal of "soldiering" on the job, though, is not the fault of the foreman. Some workers, for instance, allow old grudges to slow them down. Others are not working at the jobs that suit their abilities best. Some would work better but don't know why they should. Still others feel they are not given the recognition they deserve. And then there is sometimes the guy who just naturally doesn't like to work.

If a foreman has his workers behind him, they will take care of the man who wants a free ride. He will either get off the train or do his share of stoking the boiler. On the other hand, the best treatment for the grudge-nurser is to keep on dealing with him fairly and pleasantly until he sees that his grudge isn't getting him anywhere and that he is only making himself unhappy and unpopular.

Remedying the Misfit

The misfit needs only one thing—assignment to a job he can do better and be happier in. Here the foreman's job is to be alert to spot job dissatisfaction, to analyze the misfit's abilities and to give him a chance to work somewhere else, even if it means going all the way to the personnel director to find something suitable.

The man who would work better if he could see any reason for it may take a good deal of working on, but he can be brought around finally by a patient, well-informed foreman. A good foreman will have all the facts at his fingertips—where the company stands, what becomes of the coal the miner sends to the surface, the wide range of skills needed to keep the business going, the effect of work lags on production costs and on jobs for miners, the way competition muscles in on coal's markets and the man's own place in the over-all production picture. The foreman should take every opportunity to pass these facts along to his men, singly and in groups, to show them how their company depends on them and needs their cooperation.

Finally, all men like to have their achievements recognized. To satisfy this desire, the foreman should take a minute or so with a miner to tell him he has done a good job. In this way, the foreman can build a friendlier and more cooperative attitude among his men. It takes only a little time to give a man a pat on the back but it will be reflected many times over in steadier work and increased production.

4 MILLION HP CONFIRMS IT

FOR TOUGH MOTOR JOBS, YOU CAN'T BEAT

TRI/CLAD

EXTRA PROTECTION

To date, a million and a half Tri-Clad motors, with a total output of over 4-million horsepower, have been purchased by American industry!

In every kind of plant from steel mill to dairy, these motors are proof beyond doubt that you can't beat Tri-Clad extra protection for tough motor applications. Even on jobs where special protective enclosures would ordinarily have been specified, Tri-Clad open motors, applied during the war years, have stood up to heat, dust, and dampness, operating smoothly and efficiently for years with only minimum maintenance.

Today, the Tri-Clad motor family includes many different types and sizes. But whatever your selection, the Tri-Clad motor nameplate is still your best assurance of a high return on your motor dollar. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

EXTRA PROTECTION . . . AGAINST PHYSICAL DAMAGE!

Rigid cast-iron frame and end shields protect vital motor parts from external abuse. Because they're not at the mercy of a coat of paint, they strongly resist chemical attack and dampness. Cast iron also gives you wide, nonyielding fits between end shields and frame for ease of assembly.

EXTRA PROTECTION . . . AGAINST ELECTRICAL BREAKDOWN!

Motor windings of Formex* wire, together with improved insulating materials, reduce the chances of electrical failure. Heat is dissipated quickly—motor stays young for years and years!

EXTRA PROTECTION . . . AGAINST OPERATING WEAR AND TEAR!

Bearing design affords longer life, greater capacity, improved lubrication features. Bearing seals retain lubricant, keep out dirt. One-piece, cast-aluminum rotor is practically indestructible.

*Trade-mark Reg. U.S. Pat. Off.

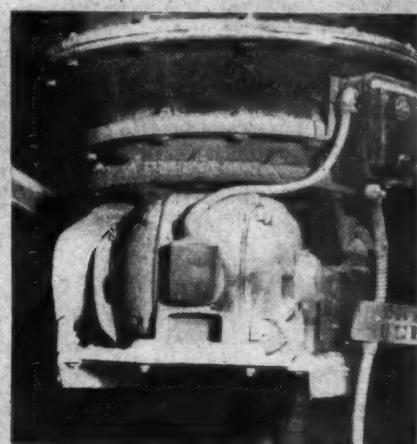
The toughest TRI/CLAD ever built!

Newest addition to the Tri-Clad motor family is the Tri-Clad totally enclosed, fan-cooled motor for use in adverse atmospheres. It gives you these important construction features:

- A cast-iron, double-wall frame which completely encloses and protects the windings and punchings.
- A nonshrinking compound around motor leads which protects motor interior from dust and moisture.
- A rotating labyrinth seal which further protects the motor interior from damage by foreign matter.

GENERAL ELECTRIC

750-287C



THE ALUMINUM ORE COMPANY

operates one of the world's largest hydrofluoric acid plants at East St. Louis, Ill. It is a modern plant and uses many electric motors in its highly mechanized materials-handling systems. As a rule, special protective enclosures are used to keep out fumes and dust. But in this case the Tri-Clad open (dripproof) motor you see here has been in service for five years without a single failure. It has operated continuously—24 hours a day, seven days a week. Yet the only maintenance required has been periodic inspection and lubrication. Behind the unusually fine service record of this motor is the extra protection built into every Tri-Clad motor. It's in there for keeps to give you better motor performance at lower cost.

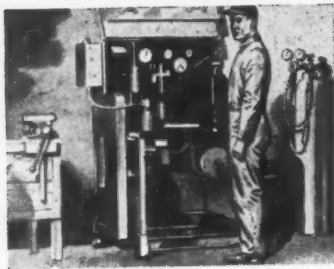


TRI/CLAD

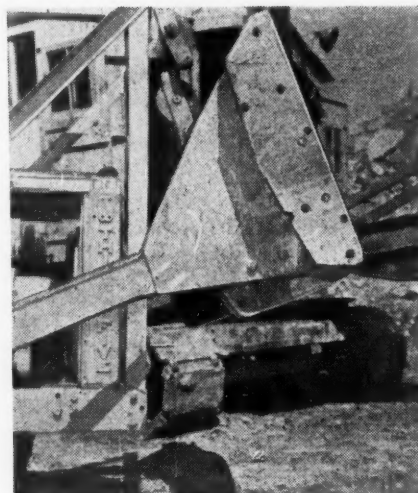
REG. U.S. PAT. OFF.

MOTORS

- OPEN (DRIPPROOF)
- TOTALLY ENCLOSED
- EXPLOSION - PROOF



Operating Ideas



LEFT: The clean-up bulldozer moves in as the shovel unloads. RIGHT: Specially-built heel keeps 'dozer blade from digging into clay as it moves loose coal toward the bench.

Clean-Up Bulldozer Teams With Loading Shovel

WORKING ALONG with a horizontal-thrust loading shovel, as shown in the illustration at the left, a clean-up bulldozer saves labor costs, reduces accident hazards and speeds shovel operation at the New Castle mine of the Windsor Coal Co., Windsor, Mo. The bulldozer, darting in as the loaded dipper moves toward the waiting truck, pushes loose coal up against the bench for loading into the next dipper bite. By the time the shovel dipper has

returned after unloading into the truck, the 'dozer has backed out and the way is clear for another cycle. One man operates the 'dozer, instead of the three or four men usually assigned to clean-up work.

Special heels, seen in the close-up photograph at the right, are bolted into place behind the 'dozer blade to prevent the blade from biting into the clay under loose coal as the 'dozer moves the coal toward the bench.



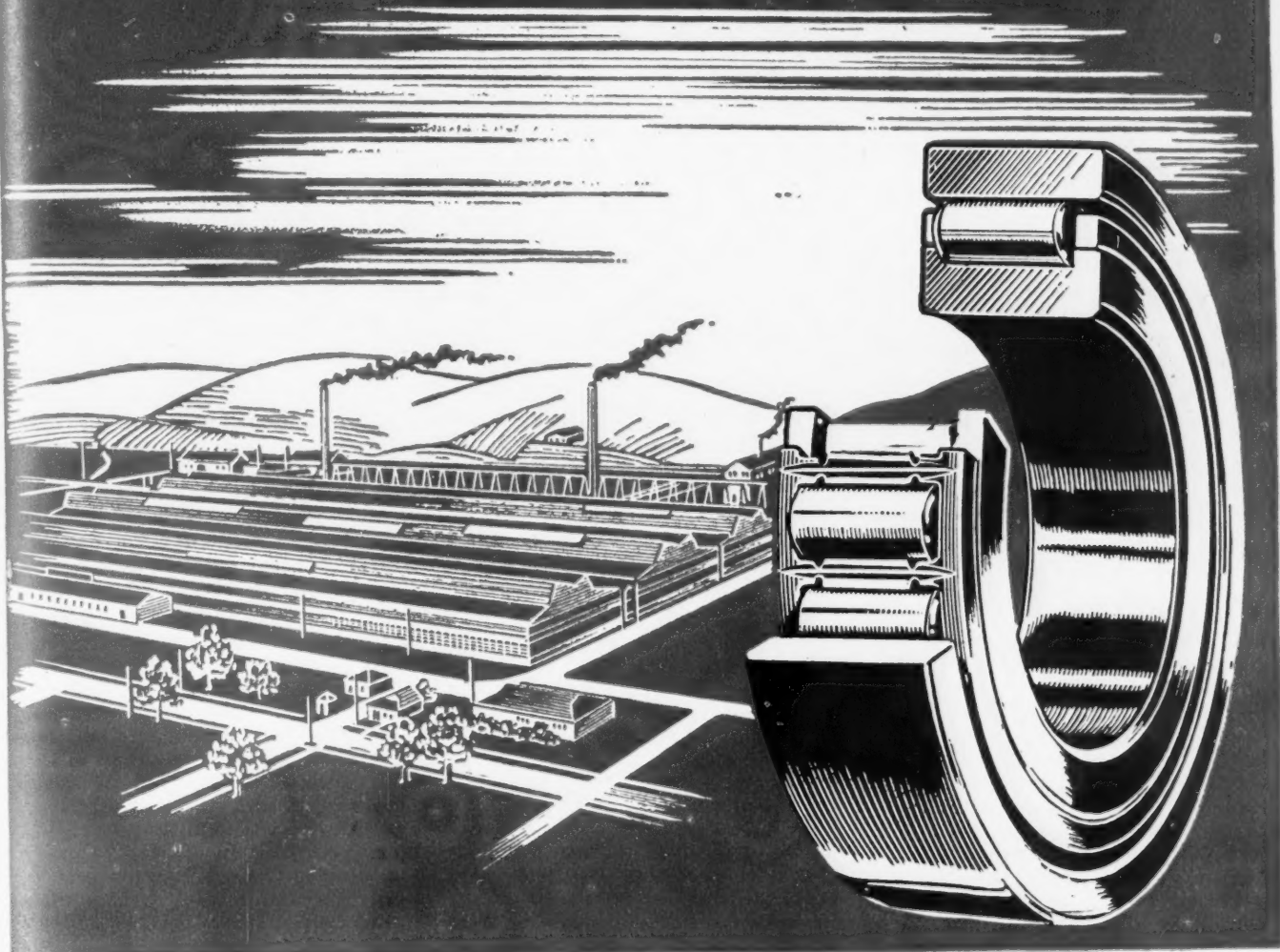
Carrier Moves Heavy Shafts in Shop

A HOME-MADE CARRIER, shown in the accompanying photograph, eliminates damage to shafts, axles, etc. by dropping, eases the lifting burden on men and reduces shop hazards at the Bevier Coal Co., (formerly the Bee Veer mine of the Binkley Mining Co., of Missouri), Macon, Mo.

In operation, the carrier is made to straddle the shaft with the wheels approximately opposite the midpoint of the shaft. With the handle of the lifting lever raised, the tongs on the opposite end are made to encircle the shaft. Lowering the handle then raises the end of the shaft that already is grasped and places the second pair of tongs in position to encircle the other end of the shaft. With both ends of the shaft thus lifted by the tongs, it can be wheeled to its destination. To lay the shaft down again, the end nearest the men is lowered and released first. Welding the lever to the U-shaped axle prevents tumbling of the axle. Two men can easily handle an 1,800-lb. shaft.

SHAFT CARRIER with one end of shaft already lifted, the other end ready to be lifted.

MAKE TYCOL ENGINEERED LUBRICATION A WORKING PARTNER



for increased production...lower operating costs



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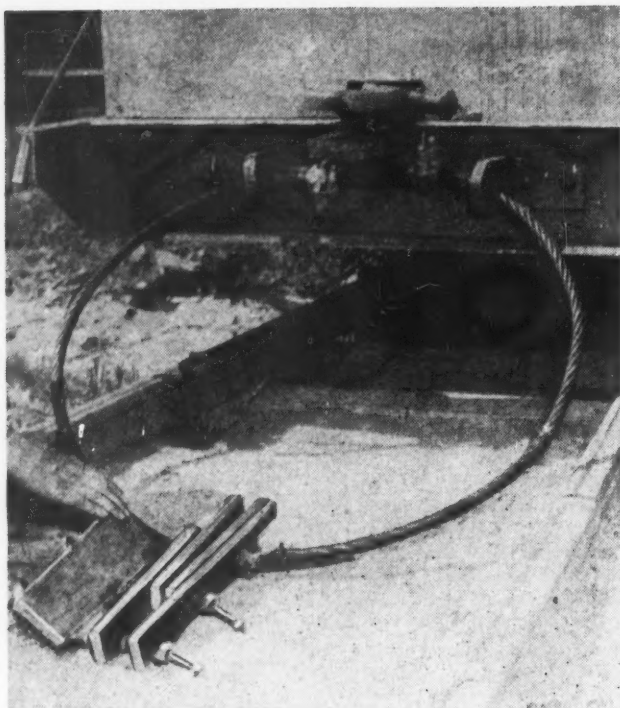
For increased production . . . top efficiency . . . lower operating cost, give your machines superb lubricants — Tycol *Engineered* oils and greases. Tycol lubricants are made to meet every lubrication need of industry — from roll neck greases for steel mills to spindle oils.

Each Tycol lubricant is *scientifically engineered* to meet specific service conditions. In every step, from selection of crudes to blending of the finished product, Tycol

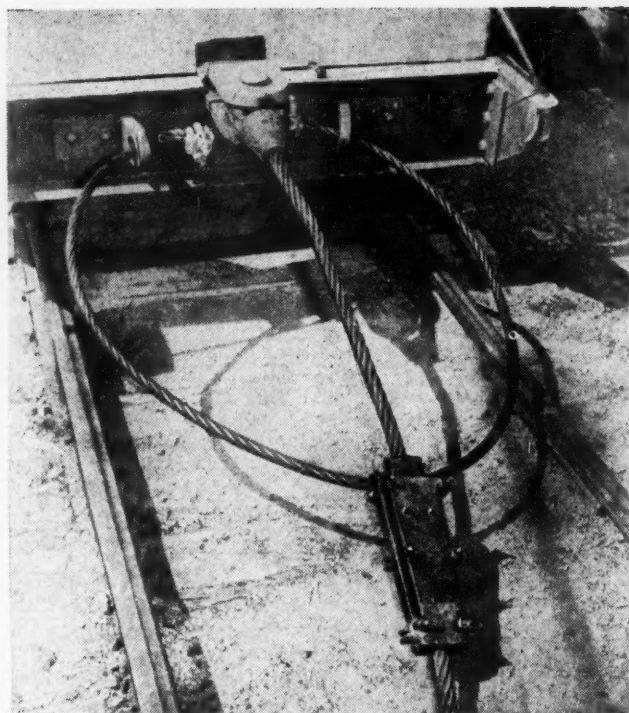
lubricants are processed to provide maximum lubricating efficiency which means greater economy, longer machine life for every type of equipment.

Tide Water Associated engineers are thoroughly experienced in all phases of industrial lubrication. Let them help you in selecting the Tycol lubricant best suited to your specific need. Write, or wire your nearest Tide Water Associated Office for complete information.

LUBRICATION—“ENGINEERED TO FIT THE JOB”



MAN-CAR safety coupling is ready for the pulling cable to be passed through the steel lock-box.



SAFETY COUPLING is locked in position on the man-car cable as the man-trip prepares to move up the incline.

Special Coupling Guards Man-Trip on Incline

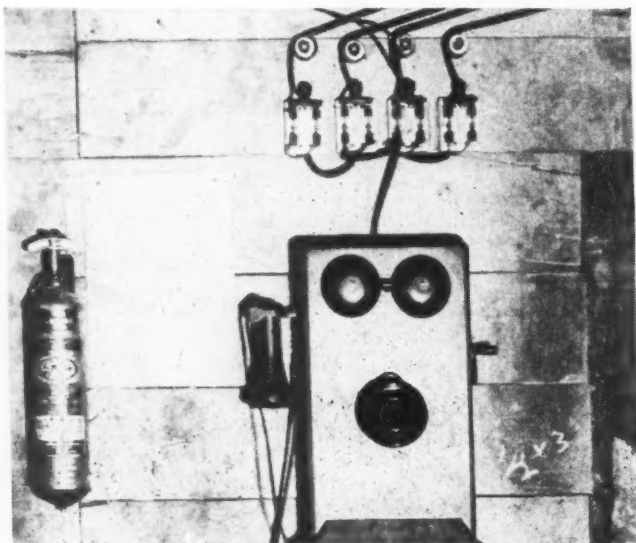
A SPECIAL COUPLING for the man-car cable provides safety for men being hauled up and down the incline at the Eagan mine, Blue Diamond Coal Co., Eagan, Tenn. Planned by W. I. Strunk, superintendent, and built in the mine's shop, the coupling consists of a loop of cable passed through two eyes bolted to the man-car and locked with two clips. The loop also is fastened securely to a 14-in.-long steel trough, which is provided with screw locks and a hinged top plate. The trough is sized to accommodate two concave wedge-

shaped steel pins that taper toward the drumhouse and away from the man-car. The cable loop, the steel trough with its screw locks and hinged top plate, together with the wedge-shaped steel pins, are shown in the accompanying illustration before the man-car cable is attached to pull the car up the incline.

For the man-trip, the man-car cable is coupled to the car as usual. The safety coupling with its cable loop then is raised up and the man-car cable is laid between the steel wedges loosely inside the steel

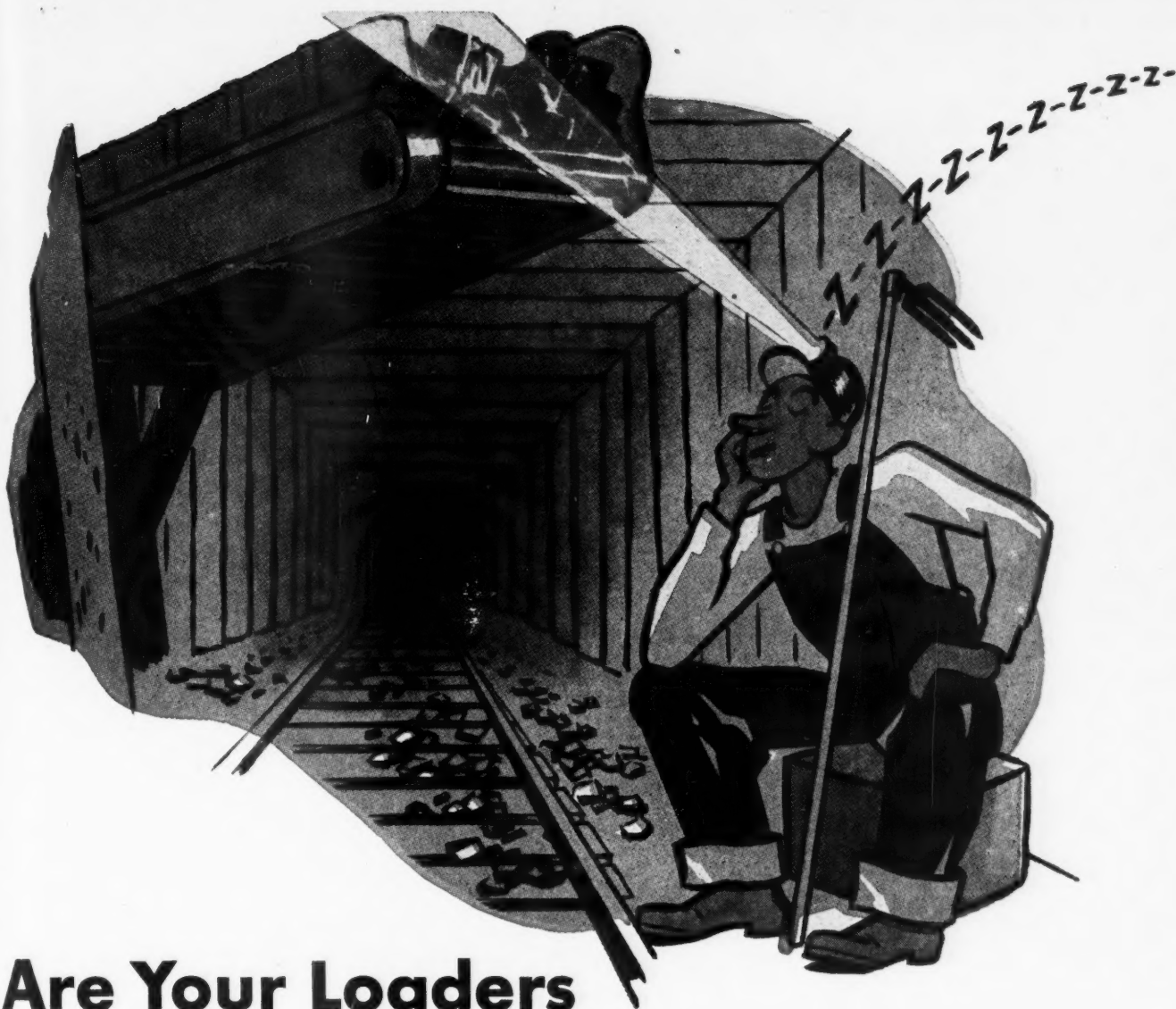
trough. The hinged top plate is closed down and locked tight with the screw locks and the wedges then are tightened against the cable by driving them in lightly, in a direction away from the man-car. Thus the man-car cable is held securely in the steel trough. If the man-car cable breaks anywhere between the lock and the usual coupling or if the ordinary coupling should fail to hold, the upward pull of the cable will cause the steel wedges to lock even tighter against the cable and the man-car will continue safely.

Switches Spot Grounded Telephone Line



A GROUNDED TELEPHONE line is located quickly, without interruption to other lines in the system, by a battery of four knife switches at the Marion mine, Black Diamond Coal Mining Co., Marion, Tenn. The phone system, independent of the local telephone company, serves the mine office, the main office at the foot of the incline, the shop and the inside of the mine. The switches are mounted above the shop telephone, shown in the accompanying photograph. To locate a grounded wire, each switch is pulled in turn, until the wire is found that will not sound the telephone bell when the telephone crank is turned. Failure of the bell to ring when the crank is turned means that the generator is cut out and that the line is grounded. Meanwhile, until repairs are made, the other three lines can remain in use. This trouble-spotting system was rigged by T. R. Rice, chief electrician at the Marion mine.

FOUR SWITCHES enable chief electrician to spot a grounded telephone wire without interrupting service on ungrounded lines.

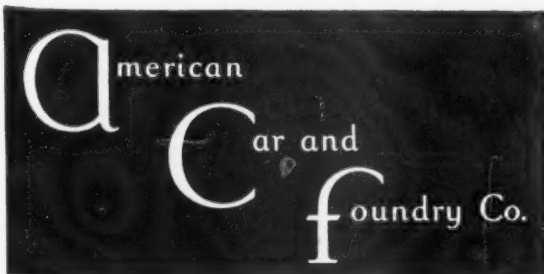
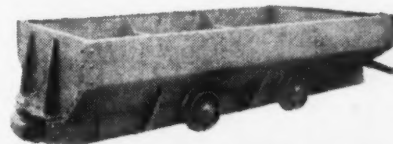


Are Your Loaders **CAR-HUNGRY?**

To get the coal out fast and efficiently you need a steady stream of empties returning to the mine...an ample supply of up-to-the-minute mine cars...always there "on time" to keep the loading machines in continual operation.

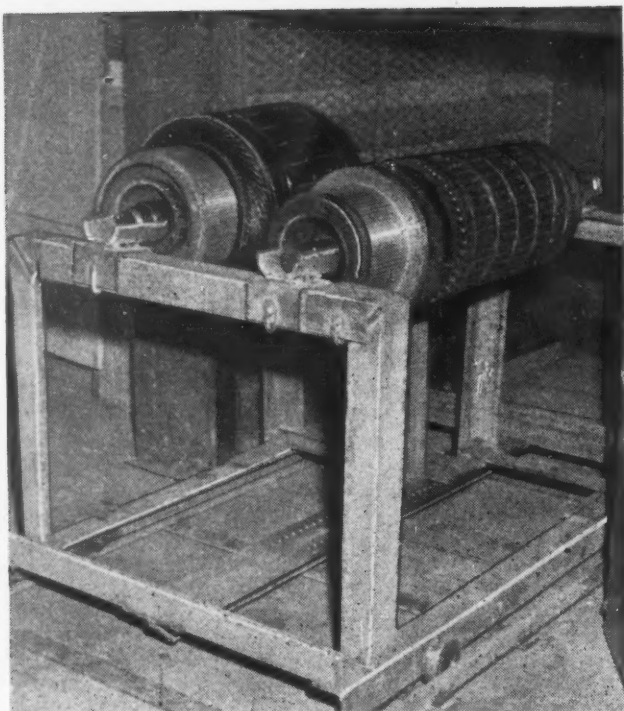
Modern **A.C.F.** Drop-Bottom Cars keep the loaders busy. Automatic dumping saves time...permits empty cars to be returned to the loading point quickly. It speeds up loading and reduces your costs per ton!

Ask our Sales Representatives about changing-over your mine to **A.C.F.** Drop-Bottom Cars for lower costs per ton!

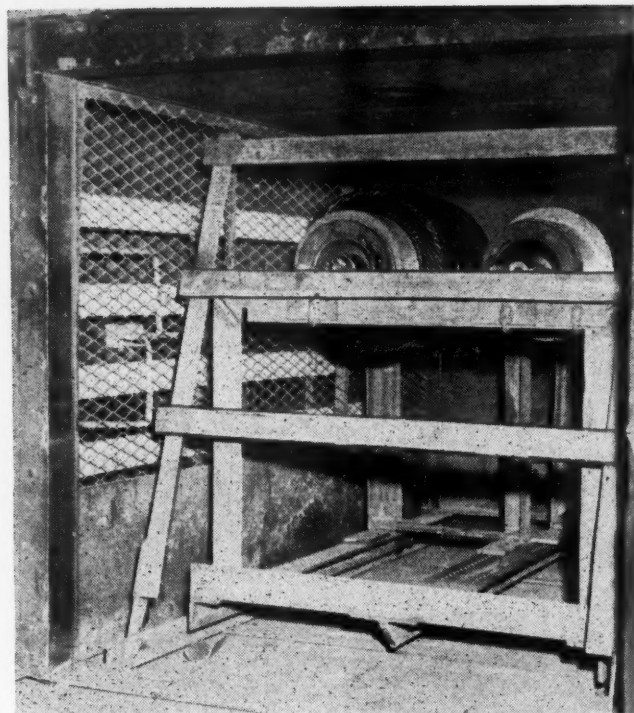


MINE CARS

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ST. LOUIS • BERWICK, PA. • PITTSBURGH • PHILADELPHIA • SAN FRANCISCO



ARMATURE RACK in position for the shop crane to lower or lift the armatures.



ARMATURE RACK pushed into the baking oven and the front section of the track hinged up into the oven so the door can be closed.

Sliding Stands and Hinged Track Serve Baking Oven

HINGING THE TRACK so the outer section folds back into the oven was the solution of a problem in devising a handy armature rack for a baking oven recently installed in the central shop of the Rail & River Coal Co., Bellaire, Ohio. This rack, which is on wheels and pulls out so that the bridge crane can handle armatures onto it, has adjustable supports for

two large armatures. Length adjustment is secured by sliding the rear supports, which have bases that do not tip easily, and dowel pins to fit into a series of holes drilled in the bottom members of the rack.

Hangers that support the shafts hook securely onto the top cross angles but can be removed by sliding them to a notch at the left end.

Several sizes of hangers are provided. Some have half-round extensions several inches long to accommodate those armatures with short shafts, for example, the Westinghouse No. 907 locomotive armature at the left in the illustrations. The other armature is one from a Goodman shortwall cutting machine being overhauled.

"Operational Ideas" for Coal Mining

AS A RESULT OF OBSERVATIONS in the course of his work as a representative of a manufacturer of coal-mining equipment, S. J. Wills, Springfield, Ill., offers the following suggestions for possible investigation by men engaged in production:

"Split-Second Timing for Gaging and Hoisting in Deep-Shaft Mines—Industry other than coal mining has made wide use of photoelectric cells for improved timing and counting, and for safety devices. We believe that photoelectric cells could be used in conjunction with an automatic—or manual—pit-car caging machine in lieu of a manually operated signal bell. Results would be split-second timing for deep-shaft hoisting and elimination of caging mishaps caused by the 'human element,' which not only are costly to repair but also cause a loss of valuable operating time.

"Increasing Pit-Car Averages—In coal mines that are hoisting on limited time and in mines where there is a pit-car shortage, the pit-car

average is of vital importance to the daily tonnage. A substantial gain in pit-car capacity could be obtained by installing a vibrating loading platform to stand the cars on at centralized loading points, i. e., conveyor and belt-delivery stations. Vibrating the cars during loading would result in packing into them a large tonnage.

"Two-Speed Hoists for Car-Spotting—A two-speed hoist at a car-spotting point is more desirable than a single-speed unit due to its flexibility, speed and lower maintenance. The writer suggests that two men, i. e., motorman and conveyorman at central loading stations, could be eliminated from many loading crews by installing suitable remotely-controlled car-spotting equipment to handle trips.

"Graphite-Impregnated Trolley Shoes—The writer suggests that some coal mines are experiencing excessive trolley-wire wear as a result of the insistence of the mine personnel on longer-wearing trolley shoes. To ob-

tain long wear on trolley shoes, one must have a shoe that is more durable than the trolley wire. It is obvious that the trolley wire then takes the wear. We suggest trolley shoes softer than the trolley wire and impregnated with graphite as a basis for lubrication.

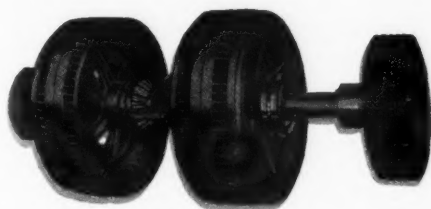
"Feeder Conveyors in Conjunction With Belt-Conveyor and Shuttle-Car Haulage—In mines that have mechanized with mobile loaders served by shuttle cars and belt conveyors which discharge coal at a transfer station into small-capacity mine cars, the surge of coal from a high-speed belt necessitates an impossible car change. We suggest that by discharging the shuttle-car load onto a 'feeder conveyor,' a slow belt speed can be maintained. Slowing down the belt would result in longer belt life, a reduced power consumption and a slower, more-uniform discharge of coal at the discharge point, or loading station, which the small-capacity cars would readily handle."

frictionless as fluid drive

... The New P&H Magnetorque Swing

look to...

P&H
for added values



The New P&H Magnetorque Swing

Power for swing and propel transmitted by electro-magnetic forces. Operated by small generator on main engine; controlled from operator's station. Swing motions, slow or fast, have cushioned acceleration and deceleration. Because there is no friction swing, there are no friction problems. One more in the long list of P&H Added Values.

Wherever you find the P&H Model 1055 on the job, you'll hear owners singing its praises for the new Magnetorque swing which marks the end of swing friction trouble and costly maintenance.

No Friction . . . No Friction Problems

The new Magnetorque solves the problems of old style swing clutches . . . by completely eliminating friction.

Without mechanical linkage . . . without friction . . . without wear — the Magnetorque transmits power for both swing and propel motions — and does it better.

Makes Production Purr

Because it's smoother, faster, more responsive . . . because it permits quicker, more accurate stops and starts — the Magnetorque swing cuts wasted operating time, increases daily production and lowers yardage costs.

The Swing of a Lifetime

The Magnetorque is built to last the life of the machine. And during this time not so much as a single hour will be required for its repair, replacement, or maintenance.

It's one of the most important improvements in the past twenty-five years . . . users all over the country say so . . . performance has proved it. Write for complete information.

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EXCAVATORS - ELECTRIC CRANES - ARC WELDERS - HOISTS - WELDING ELECTRODES - MOTORS

Twin Tracks Permit Slate Cars to Bypass Scales

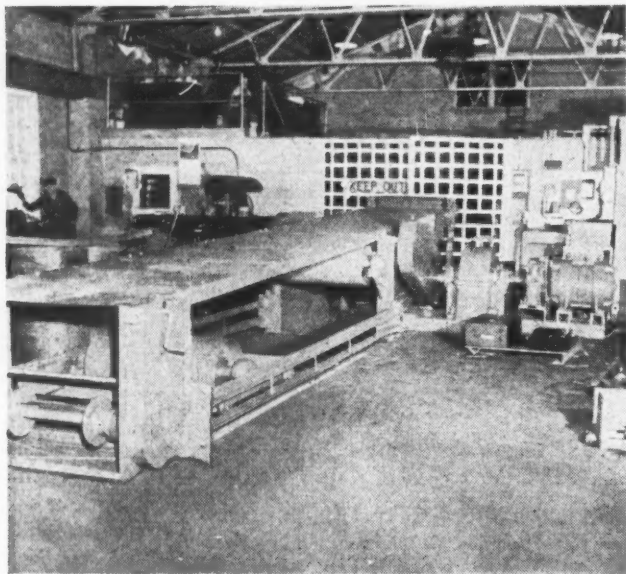


SHUNTING CARS loaded with slate and rock so that they by-pass the scales without breaking the train is provided by an arrangement at the Eagan mine, Blue Diamond Coal Co., Eagan, Tenn. Shown in the accompanying illustration, two additional rails, offset about 4 in. from the regular rails and not connected to the scales, are arranged so that the slate and rock cars can be shunted onto them by a switchman. Throwing the switch back and forth as the cars pass him, he sends coal cars over the right-hand track (rails 2 and 4) and slate and rock cars over the left-hand track (rails 1 and 3). Ordinary slack in the couplings permits this shunting without breaking the train. At the far end of the weigh-house, the twin tracks merge again at another switch.

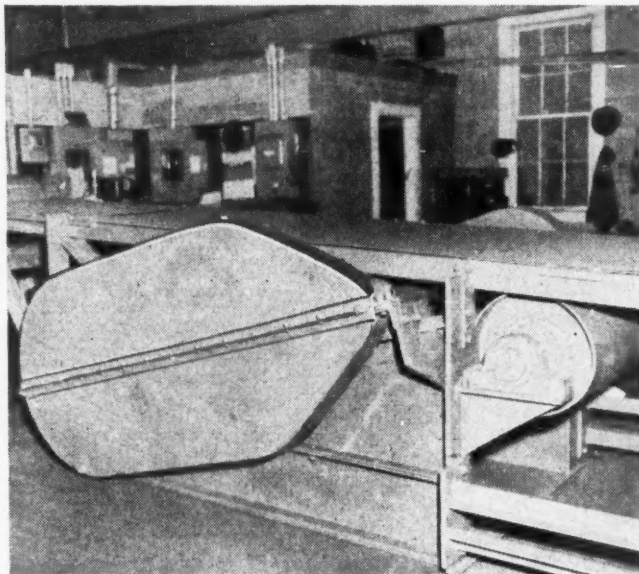
After dumping at the headhouse, the empty train returns over the left-hand track and thus bypasses the scales again.

In addition to preventing rock and slate from being weighed with coal, the twin tracks save wear and tear on the scales and provide fast weighing for coal.

TWIN RAILS provide shunting of rock and slate cars off the scales without breaking the train and thus save wear on scales.



THE TAKE-UP and driving unit assembled in the shop for testing.



GEARS of the drive head operate in oil-tight cases.

Shop Builds Belt-Conveyor Heads to Beat Delivery

RATHER THAN wait several months for factory delivery of a drive head urgently needed for extending underground belt conveyors in the new Crichton No. 4 mine, Nettie, W. Va., the Johnstown Coal & Coke Co. undertook to build one at its new shop at that mine. The completed unit was successful from every standpoint and when another drive head was needed and factory deliveries were still slow, it also was built in the shop.

The second unit, completed in May, 1947, and shown in the accompanying illustrations assembled for testing, drives a 36-in. main belt at 371 f.p.m. Pulley shafts have roller bearings and the unit includes a takeup pulley with 5-ft. adjustment actuated by a wire-rope winch. The 50-hp. 440-volt Westinghouse motor is fitted with a Cutler-Hammer magnetic brake and the gear reducer was made by the Ferrell Foundry & Machine Co. Walter

Little is shop foreman at this operation, E. P. Reed, maintenance engineer, W. H. Seelinger, general superintendent, A. B. Crichton Jr., assistant to the president.

What About That Pet Idea?

Most of us have had "pet ideas" we've gotten a big kick out of putting to work successfully. Don't keep yours a secret! Send us those "Operating Ideas" you're proud of and let others know about them, too. If acceptable, Coal Age, on publication, will pay you \$5 or more for each.

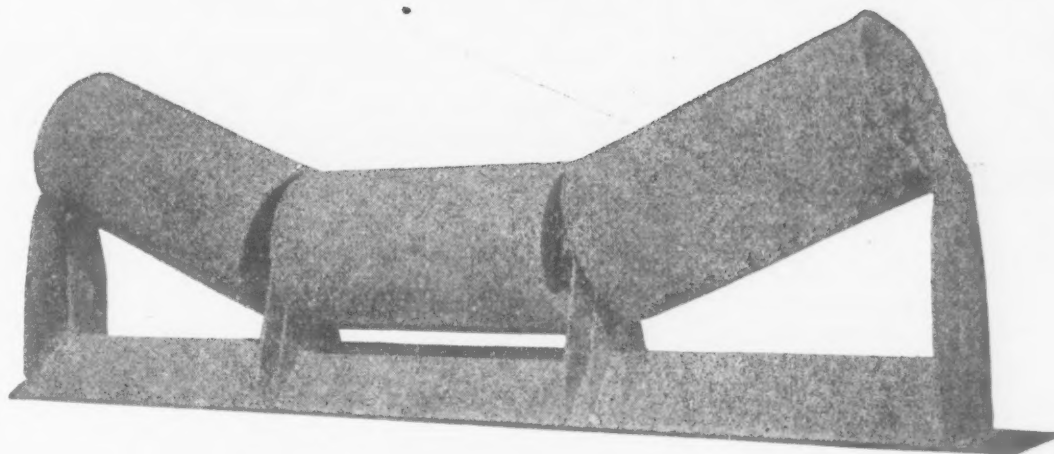


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strength and*

trouble-free operation!



Kremser's IDLER requires no greasing for the life of the bearing . . . only one of many features of this new improved all steel welded conveyor idler.

Today this **Kremser** equipment is being used for heavy conveyor duty because of its many points that save dollars in service and maintenance. The quadruple neoprene sealed, pre-

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When you are ready to buy Conveyor Equipment it will pay you to consider the cost-saving advantages of **Kremser**. Complete conveyors engineered to your needs. To get full details of **Kremser** equipment write us today.

KONVEY THE
REMSER WAY

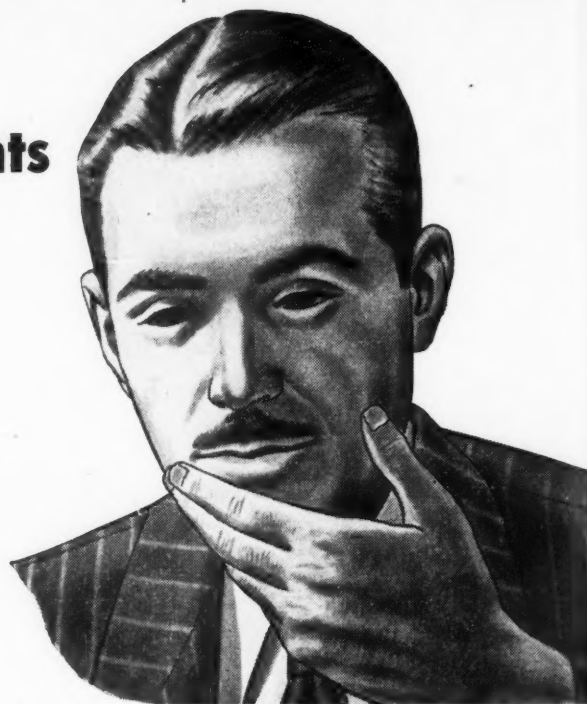
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Can I fill my Hose Requirements with pre-war quality goods?



Your Thermoid Distributor* Will Know!

He will tell you *No*. Today's products carrying the Thermoid trade mark are even better than pre-war quality. War born experiences plus latest technical advances provide the added quality. This new quality is in production . . . it is no longer necessary to take whatever you can get.

He can also tell you—

That Thermoid hose is made in a wide range of types and sizes. And, every type measures up to the service conditions for which it is sold.

He knows something about Thermoid too—

Thermoid concentrates its manufacturing for industry on the well integrated line shown below. The Company itself, is large enough for precise, low cost, high quality production, but small enough to be quickly responsive to customers' specific problems. That's one of the reasons why—

It's Good Business To Do Business With Thermoid!

*
A postcard or a letter to the home office will bring his name and address to you.

Manufacturers of new equipment are invited to correspond direct with the home office.



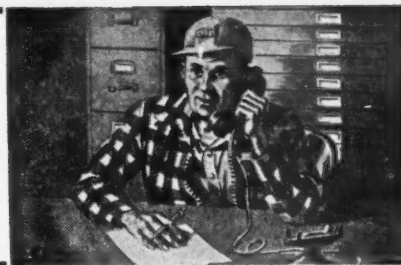
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Thermoid Company, Trenton, N. J., U. S. A.

The Thermoid Line Includes:
Industrial Brake Linings and
Friction Products • Transmission
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V-Belts • Conveyor Belting •
Elevator Belting • Wrapped and
Molded Hose • Custom Molded
Parts.

News Round-Up



Coal Shortage Local, Industry Group Says

While preferred grades of coal will be tight in some areas, there is no general shortage of coal, a group of industry, government and transportation leaders attending a meeting conducted by James H. Boyd, director, U. S. Bureau of Mines, concluded Oct. 23. Midwest cities, it was said, will be chiefly affected by the shortages and consumers were advised to take what they could get. Stockpiles were estimated to hold a 37-day supply.

Some relief in the shortage of railroad cars is to be expected. In a joint statement issued after the meeting, the group said: "it appears that the car supply will be somewhat improved with the close of the Great Lakes navigation season and as the movement of some few other commodities will be curtailed during the winter season." This, plus shortening of turn-around time, "will substantially meet total coal requirements for all purposes." While railroad cars for coal are in slightly better supply than a year ago, they are still short by 25,000 a week, it was said. Anthracite was expected by the group to meet requirements, but with nothing to spare.

Coal industry representatives attending the meeting included: O. L. Alexander, Pocahontas Fuel Co.; Richard L. Bowditch, C. H. Sprague & Son Co.; Henry T. DeBardeleben, DeBardeleben Coal Corp.; Robert Duemier, D. L. & W. Coal Co.; Charles O'Neill, United Eastern Coal Sales; George W. Reed, Peabody Coal Corp.; Joseph L. Dunn, U.M. W.A.; J. Atlee Schafer, American Retail Coal Association; and H. G. Ward, American Coal Sales Assn.

Oil, Gas Shortages Forecast for Winter

Predictions of serious shortages of oil and gas for heating and industry during the coming winter and the suggestion that the industries cease further conversions from other fuels and concentrate on conservation, were sounded by several speakers at 29th annual convention of the American Gas Association in Cleveland last month.

In his address, R. T. Hargrove, president, Texas Eastern Transmis-

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sion Corp., and retiring president of the association, said that the gas industry was facing another shortage similar to that of last winter and urged that proper conservation measures be taken immediately and customers be prepared through proper publicity. He pointed out that the shortages would result from a lack of distribution and production facilities and not from a shortage of gas.

Max W. Ball, director, oil and gas division, U. S. Department of Interior, warned of a tight fuel supply not only for this winter but for five years ahead. Fuel oil demand, he said, would be 20 to 40 percent greater than last year, "yet we enter the heating season with less in storage. The plight of some of those who have installed new oil burners without firm assurances of supply from reliable fuel oil dealers may be especially tough." Nelson L. Smith, chairman, Federal Power Commission, called for gas firms to put an immediate "curb on the expansion of market demands, at least until transmission capacity has a chance to catch up."

A. L. Nickerson, director, domestic marketing, Socony-Vacuum Oil Co., said that his company was sending a letter to all its customers urging conservation of fuel oil and suggesting that they pass the message along to their customers. "It is unwise for the industry to encourage its prospective customers to convert to oil from coal or other forms of fuel," he said. "Our industry needs nothing so much as a breathing spell and a chance to catch up with the existing demand."

Natural-Gas Pipeline Asked for New England

The Federal Power Commission was asked Oct. 20 by the Tennessee Gas & Transmission Co. for permission to extend capacity of its natural gas system by 455,000,000 cu.ft. daily to serve new customers in eastern New York and New England.

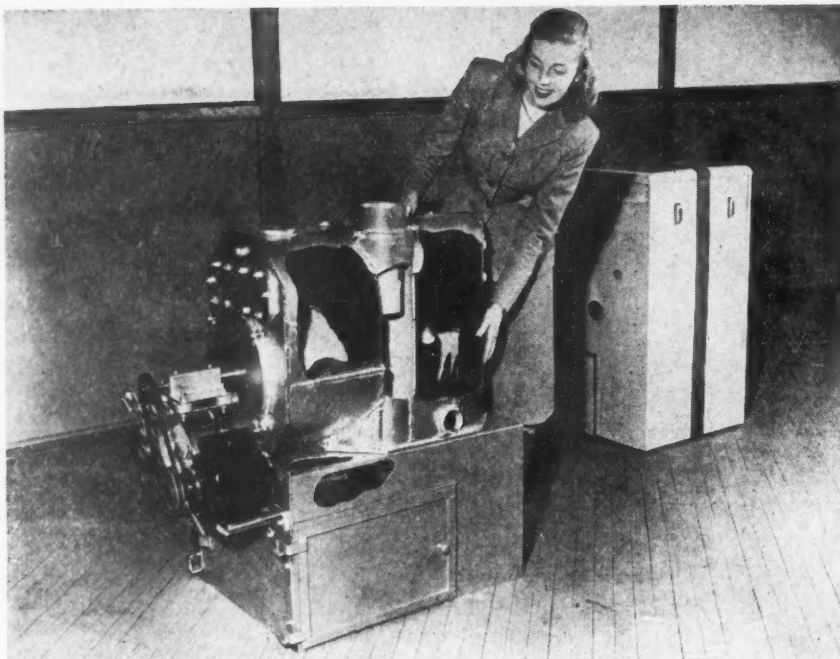
The new construction outlined, which would cost an estimated \$150,000,000, includes 901 miles of pipeline to be laid alongside the company's present line from Texas to Burnaugh, Ky., an extension line from that point to a point near Boston totaling 790 miles, new compressor stations and equipment and other facilities. The extension from Burnaugh to Boston would run northeasterly through Ohio, the northwestern tip of Pennsylvania, south of Buffalo to Albany and then through northwestern Massachusetts. The company said that it now has sales demands for 430,000,000 cu.ft. daily over its present capacity.

Anthratube Gets First Showing in New York

More than 50 writers for home magazines, newspapers, radio and the coal-trade press saw two models of the Anthratube, new burning unit for home users of anthracite, at a preview in New York City, Oct. 23. Models on display and now in production were described by manufacturers' representatives. The result of three years' research and testing by the Anthracite Institute, including year-round operation in 150 homes last winter, the Anthratube is said to save from 15 to 38 percent of anthracite normally used in a home and to operate at 80-percent efficiency, as compared with 50 to 65 percent in conventional burning units.

Delivered as a completely assembled unit, the Anthratube can be installed in about 10 minutes, exclusive of connections, declared F. W. Ernest, president, Anthracite Institute. An induced-draft fan prevents ash from seeping into the basement and also does away with cleaning the inner surfaces of the boiler, he pointed out.

Bin-feed and hopper types were shown at the preview. The bin-feed model, manufactured by the Axeman-Anderson Co., Williamsport, Pa., and the American Boiler Works, Erie, Pa., feeds itself automatically and burns pea-size anthracite. The hopper model, manufactured by the D. L. & W. Coal Co., New York City, burns chestnut-size anthracite and operates for several days on one filling. A boiler-burner unit releasing 240,000 B.t.u. per hour, using a modification of the Anthratube principle, has been developed by Motorstoker, Hershey Machine & Foundry Co., Manheim, Pa.,



THE ANTHRATUBE, result of three years' research, promises new comfort and economy. Now in production, it is compact and attractive in a bright-colored jacket.

and in Canada a horizontal type is being marketed by Huron Engineering & Research Co., Goderich, Ont.

New Developments

- Leasing of four Pittsburgh Consolidation Coal Co. properties in Westmoreland and Fayette Counties, Pennsylvania, by the Republic Steel Corp. was reported early last month. The mines involved include Banning No. 1, now in operation, and three operations now inactive, Banning No. 3, Youghioghney Slope and Waverly. About 3,000 acres of virgin coal, all of metallurgical quality, has been made available under the lease, it is reported, and it is understood that production from the properties will go to Republic's operations in the Youngstown, Warren and Cleveland districts.

- Purchase by the Bethlehem Steel Corp. of the Minds Coal Mining Corp., Ramey, Pa., with a mine in operation at Monterville, near Elkins, W. Va., was announced Sept. 30 by representatives of the two firms. Production from the mine, which is about 12 years old and operates in the Sewell seam, is expected to be used in Bethlehem's coke ovens. There will be no immediate change in operating policy, it was said.

- Opening of a new stripping operation in Hopkins County, Kentucky, with an ultimate production of 2,000 tons daily, has been announced by the newly formed Stony Point Coal Co. Initial production is expected to begin about Dec. 1 and the coal, from the No. 9 seam, will be separated over a four-track tippie and shipped from Providence, Ky. Offices of the

new company will probably, though not definitely, be located at Providence, and officials of the organization are: Justin Potter, president; E. E. Wilson, vice president; Stuart Kritsky, secretary-treasurer; and E. E. Steff, manager. The Nashville Coal Co., of Louisville, and the Nashville Coal Co., Inc., of Nashville, will act as joint sales agents.

- Change of name of the Industrial Collieries Corp., a subsidiary of the Bethlehem Steel Corp., to the Bethlehem Collieries Corp., has been announced, effective Oct. 1, 1947. Administration, operating procedure and present personnel will not be affected by the change, according to a statement by K. M. Quickel, manager.

- Also effective Oct. 1, 1947, the Susquehanna Collieries Co., Naticoke, Pa., a subsidiary of The M. A. Hanna

Co., has been absorbed into the parent company, and will be known in the future as the Susquehanna Collieries Division of The M. A. Hanna Co. The new setup does not change the conduct of operations or personnel of the organization and the M. A. Hanna Co. will continue to direct all sales for the new division.

- Rehabilitation of the old Carolina Slope, near Sanford, N. C. (*Coal Age*, September, 1946, p. 117), by the recently formed Raleigh Mining Corp., owned by Walter Bledsoe & Co., Terre Haute, Ind., John S. Marshall and associates, reportedly got under way recently in the first step in the development of the Deep River coal fields. The 1,000-ft. slope is to be restored and widened, with steel supports replacing present wooden timbers, it is understood, and the mine is to be a completely mechanized operation. Equipment and development reportedly will cost more than \$1,000,000. Initial production is said to be planned at 500 tons daily, later increasing to 1,400 tons per day.

Officers of the Raleigh organization are: W. B. Webster, president; John S. Marshall, vice president, treasurer and general manager of operations; and Howard N. Butler, secretary.

- First production from the new Har-mattan mine of the Fairview Collieries Co., four miles west of Danville, Ill. (*Coal Age*, February, 1946, p. 140), is expected to begin next summer, according to the latest information available. The tippie and washing plant now under construction by the McNally-Pittsburg Mfg. Co. is scheduled to be completed by January, and delivery of the 25-yd. 1150B Bucyrus-Erie dragline is planned for next April. Capacity of the operation is set at 5,000 tons daily and 2,000 acres of coal land is available for development.


Overburden is expected to average 75 ft. Coal will be loaded by a 7½-yd. Marion 4121 shovel into 25-ton trucks for haulage to a raw-coal hopper, from which a belt conveyor will take

Business and Industrial Activity

	1947 to This Date	1947 Over 1946 to Date
Est. anthracite prod., Sept., 1947, net tons.....	5,136,000	42,013,000 — 7.3%
Est. bituminous prod., wk. end. Oct. 18, 1947.....	12,600,000	487,130,000 + 13.6%
Sales, domestic stokers, Aug., 1947.....	8,559	39,433 — 68.2%
Sales, domestic oil burners, Aug., 1947.....	113,323	713,410 +180.4%

	Latest Week*	Month Ago	Year Ago
<i>Business Week Index of Business Activity, week end.</i>			
Oct. 18, 1947	185.0	181.8	183.9
Steel ingot operations (% of capacity).....	97.1	94.1	90.3
Electric power output (million kw.-hr.).....	4,946	4,977	4,540
Crude oil prod. (daily avg., 1,000 bbl.).....	5,268	5,200	4,733
Misc. & L.C.L. carloadings (daily avg., 1,000 cars).....	93	88	87
All other carloadings (daily avg., 1,000 cars).....	67	66	63
Prices, spot commodity index (Moody's, Dec. 31, 1939 = 100).....	453.0	429.0	350.7
Prices, industrial raw materials (B.L.S., Aug., 1939 = 100).....	283.2	272.0	209.2
Prices, domestic farm products (B.L.S., Aug., 1939 = 100).....	397.3	380.4	317.9
Prices, finished steel composite (<i>Steel</i> , ton).....	\$75.41	\$75.41	\$64.45
90 stocks, price index (Standard & Poor's Corp.).....	124.5	119.9	118.6

*Date of latest week on each series on request.



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it to the top of the 90-ft.-high plant. After washing and drying, coal will be loaded on a five-track tippie. Storage space for 80 railroad cars is provided on the ¼-mile spur to the main line of the N. Y. Central. Six 100-ton truck bins have been moved from the old Peabody mine near Catlin and erected to handle truck trade. W. A. Endicott is superintendent of the operation.

• Capacity of the Old Ben Coal Corp.'s briquetting plant at Buckner, Ill., was to be doubled last month as a complete new plant with a production of 30 to 35 tons hourly went into operation. The old plant with a capacity of 20 t.p.h. was to be shut down for extensive modernization as the new unit, housed in separate fireproof building went into operation. The plant is on a 24-hour schedule.

• A bid by the Kaiser Co., Inc., of \$1 an acre on 2,250 acres of Emery County (Utah) coal lands put up for lease by the federal district land office recently was reported as the only bid received. The company is to pay 12½¢. per ton royalty under a 20-year lease and minimum annual production is set at 140,000 tons, beginning the sixth year, it is understood.

• The Newcoal mine at Newcoal on the L. & N. R.R. in western Kentucky reportedly has been purchased by the Nashville Coal Co. The mine is a shaft operation in the No. 11 seam, producing six to eight railroad cars daily. The new owners are understood to be planning to increase capacity to 12 to 15 cars daily single-shift and 25 to 30 cars daily double-shift.

• Work on the 800-ft. air and hoisting shafts for the new Pana mine of the Peabody Coal Co. was understood to have started last month, with the announcement that contracts for the shafts had been let to Fitzsimmons & Connell Dredge & Dock Co., Chicago.

• Formation of the Excelsior Coal, Inc., Greenwood, Ark., with a total capitalization of \$100,000, was recently reported. The new company is planning to open a mine in the Excelsior area as soon as equipment can be secured and also was understood to be planning erection of a briquetting plant. Incorporators included G. L. Grant, Arkansas attorney for the U.M.W.A., Ft. Smith; Jack Rose; H. S. K. Nakdiemen and Albert Tuber, Ft. Smith; W. C. Caudle, Greenwood; and Joe McKenna, St. Louis, Mo.

• Opening of a new slope mine near Herrin, Ill., with a daily production of 200 tons, was recently announced by the Bill Ilich Coal Co. Production is to be raised to 300 tons daily when new machinery expected soon is received.

• John B. Rich, president of the Gilberton Coal Co., Gilberton, Pa., has been named as the new operator of the Packer No. 5 colliery near Girardville, Pa., according to an announcement by the Girard Estate. Operation of the colliery by the Rose Valley Coal Co. was discontinued last

MEETINGS

• Harlan County Coal Operators' Association: annual meeting, Nov. 19, Harlan, Ky.

• Winding Gulf Operators' Association: annual meeting, Dec. 5, Beckley, W. Va.

• American Mining Congress: annual meeting, Dec. 3, University Club, 1 West 54th St., New York City.

• Coal Mining Institute of America: annual meeting, Dec. 11-12, Fort Pitt Hotel, Pittsburgh, Pa.

• West Virginia Coal Mining Institute and the Central Appalachian Section, A.I.M.E.: joint meeting, Dec. 12 and 13, Daniel Boone Hotel, Charleston, W. Va.

February. While restoration of the mine was not expected to take very long, resumption of the breaker was understood to require some time and Mr. Rich was planning to send the coal to the Gilberton breaker until it could be reopened. About 600 workers were previously employed at the mine.

• A tunnel to be driven under the Sydney, Nova Scotia, harbor area, to tap 6,500,000 tons of coal is reportedly about to be begun by the Dominion Steel & Coal Corp., Ltd. The tunnel, which will be driven from Dominion's No. 18 colliery, is expected to cost \$500,000 and prolong the life of the mine by 30 years. The mine, which has employed more than 400 men, was originally thought to be good for only another year.

• The Sharon Steel Corp. is reported to have acquired full ownership of the Carpentertown Coal & Coke Co., Uniontown, Pa., with the recent purchase for \$213,025 of the remaining 50 percent of the company's stock. Sharon had acquired half-interest in the firm some time ago.

• The Indiana Farm Co. Bureau Co-Operative Association has announced the sale of its \$50,000-interest, in the Clover Darby Coal Co.'s Clover Darby mine in Harlan County, Kentucky. A 25-percent ownership of the mine property was said to be involved in the sale. The co-op will continue to receive the entire output of the mine, under the agreement.

New Mining Companies Formed

The following companies have been incorporated to mine coal, with capital and incorporators as listed, according to unconfirmed reports recently received:

Beatrice Coal Co., with offices in Charleston, W. Va., and chief works in Nicholas County; \$100,000 capital; incorporators, F. H. Martin, F. L. Greenlee and V. H. Shank.

Miller's Creek Coal Producers, Inc., and Clay County Coal Producers, Inc.

Lexington, Ky.; \$50,000 capital stock each; incorporators, L. M. Cook, J. L. Davis and R. F. Houlihan.

Cedar-Gas Coal Co., Patlin, W. Va.; \$75,000 capital; incorporators, A. D. Collins, H. B. Kinzer and Ethel and J. B. Aldrege.

Gunter Coal Co., Beckley, W. Va.; \$50,000 capital; incorporators, D. D. Ashworth and C. C. Sanders.

Trotter Co., Morgantown, W. Va.; \$100,000 capital; incorporators, J. T. Trotter, B. C. Reeder and others.

Mingo-Wyne Corp., Williamson, W. Va.; \$10,000 capital; incorporators, W. B. Hogg, E. R. Ward and others.

The Sheffield Coal Co., Beaver Dam, Ky.; \$15,000 capital; incorporators, Jess, C. H. and Almada Sheffield.

The Cumberland Coal Co., Cumberland, Ky.; \$30,000 capital; incorporators, Nick Ernest and E. and Carl Lawrence.

Jackson Transfer Coal & Lumber Co., Middlesboro, Ky.; \$25,000 capital; incorporators, M. J. Jackson, H. P. Pickle and others.

Clybourne, Inc., Bluefield, W. Va.; \$100,000 capital; incorporators, C. A. and V. M. Clybourne, R. E. Perkinson and others.

The Garland Pocahontas Coal Co., Keystone, W. Va.; \$10,000 capital; incorporators, A. O. Garland, Joseph Pais, and Charles Tutwiler.

White Oak Mountain Coal Co., Beckley, W. Va.; \$25,000 capital; incorporators, R. L. Pabscott, W. E. Demoss, L. A. Taylor and others.

John A. Archer & Son, Inc., Wytheville, Va.; \$50,000 capital; incorporators, J. A. and R. R. Archer.

The Edmor Pocahontas Coal Co., Welch, W. Va.; \$18,000 capital; incorporators, R. A. Nowlin Sr., P. W. Edwards and W. C. Morgan.

Low Gap Coal Co., Elkhorn, W. Va.; \$12,000 capital; incorporators, W. C. Morgan, P. W. Edwards and others.

King Coal Mining Co., East Raintelle, W. Va.; \$10,000 capital; incorporators, A. J. O'Neal, H. H. Dew and H. G. Combs.

Orient Mine Manager Cleared, Papers Restored

Arlie Cook, night mine manager of the New Orient mine of the Chicago, Wilmington & Franklin Coal Co., West Frankfort, Ill., was cleared by the state mining board of any blame in the mine explosion that killed three men last Aug. 14. He was vindicated and his certificate was restored after a mining board meeting Oct. 1. At the hearing, Mr. Cook and other mine officials testified that he had instructed the victims not to enter the area where the blast later occurred but they had ignored his orders. Petitions expressing confidence in the manager's competence and fairness were signed by nearly all men employed on the night shift. Mr. Cook has been with the company for more than 25 years.



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Personal Notes

G. Dawson Coleman, formerly president, has been elected chairman of the board of directors of the Ebensburg Coal Co. and Coleman & Co., Inc. **F. A. Fontyn**, formerly vice president, has been elected president of the companies, to succeed Mr. Coleman.

Robert R. Estill, for the past 10 years a combustion engineer for the H. C. Frick Coke Co., has been named chief of the coal division of the American military government in Germany, succeeding **Max H. Forester**, who is expected to return to his post with Pittsburgh Consolidation Coal Co.

Robert O. Schoor has been named assistant general manager and general superintendent of operations in Ohio for the Warner Collieries Co., Cleveland. Mr. Schoor, who was superintendent of the company's Camel Run mine when he left to join the Marines in December, 1943, has been with the firm of J. W. Woormer & Associates since his discharge from service in 1946.

Clarence A. Quenon, formerly superintendent, has been named general manager of the Clear Creek Coal Co., Clearco, W. Va., succeeding **H. H. Blackburn**, who has retired after more than 17 years of service in that position.

C. R. Rankin, previously night foreman for the New River Co. at Stanaford, W. Va., has been appointed mine foreman at Dunedin No. 1 mine of the Maryland Fire Creek Coal Co., Terry, W. Va.

Otis Bledsoe, formerly superintendent of Georgetown No. 12 mine, Hanna Coal Co., St. Clairsville, Ohio, has been named assistant to **J. S. Harmon**, general superintendent of strip mines. **Donald Saxton**, assistant superintendent, has been appointed superintendent at Georgetown. **Ray Fleming**, formerly loading coordinator, has been made assistant superintendent to succeed Mr. Saxton. **Ed. Gaston**, previously with Zenith Radio Corp., Chicago, has been appointed electrical engineer for Hanna.

E. A. Miller has been named superintendent of the Midvale mine, Coal Division, Eastern Gas & Fuel Associates, Gamoca, W. Va., replacing **Myron Kok**, recently appointed to that post, who has resigned to join another organization. Mr. Miller became chief electrician at the company's Powellton No. 3 mine in 1935, and was promoted to assistant superintendent in 1940. **G. D. Holmes**, general mine foreman, has been appointed superintendent at Powellton No. 3 mine, Elkridge, W.



JOINS BCI—T. A. "Tad" Day resigned Oct. 1 from Bituminous Coal Research, Inc., Pittsburgh, to join the staff of Bituminous Coal Institute, Washington. Mr. Day, who has spent 15 years in coal public relations and promotion work, joined BCR 2½ years ago. Previously he had been associated with Island Creek Coal Sales Co. and Appalachian Coals, Inc.

Va., succeeding **Ed Briet**, who has been granted a leave of absence. **R. R. Hanna**, formerly chief electrician at Powellton No. 6 mine, has become chief electrician at Powellton No. 3. **J. H. Dunbar**, shop foreman, has succeeded Mr. Hanna at Powellton No. 6. **Ernest Slater Jr.**, assistant general mine foreman at the company's Stotesbury No. 8 mine, has been appointed general mine foreman at Eccles No. 6 mine, Eccles, W. Va., succeeding **C. A. Dickenson**, resigned.

Elmos Williams, formerly assistant mine manager, Zeigler (Ill.) No. 2 mine, Bell & Zoller Coal & Mining Co., has been named mine manager of the company's new Murdock mine. **Paul Johnson**, assistant mine manager at Zeigler No. 1 mine, has been appointed to replace Mr. Williams at No. 2 mine.

A. W. Hesse, chief engineer for the Buckeye Coal Co. mine at Nemacolin, Pa., since 1918, and assistant general superintendent for six years, is planning retirement. He had intended to retire Sept. 1 but is continuing with the company until a successor is named. Mr. Hesse was honored for his long service to the company and his contributions to the community at a farewell dinner in Uniontown, Pa., Sept. 24, attended by more than 200 company officials, employees and others. Mr. and Mrs. Hesse plan to move into their new home in Waynesburg, Pa., on his retirement.

Edward J. Marron, who resigned last January as a mine inspector for the U. S. Bureau of Mines, is now as-

sistant foreman for the Berwind-White Coal Mining Co., Windber, Pa. Mr. Marron compiled the data for the Kentucky Miner's Reference Book, published by the Kentucky Mining Institute and the State of Kentucky.

Lucien Eaton and **Fred G. Koper**, Pierce Management, Inc., Scranton, Pa., left for Turkey by air on Oct. 18th to study various mining operations in that country.

Capt. Baxter H. Bruce, U.S.N. (Ret.), has been named smoke abatement engineer for the City of Akron, Ohio, effective Oct. 1. Capt. Bruce, an Annapolis graduate in mechanical engineering, served during the war as a government inspector at Babcock & Wilcox and Combustion Engineering Co.

D. J. "Judge" Parker, 70, was to retire Nov. 1 as supervising engineer of the mine safety station of the U. S. Bureau of Mines at Birmingham, Ala., after a career of government service extending over 33 years, according to an announcement by the Bureau. Since joining the Bureau in 1914, four years after its formation, Mr. Parker has held responsible posts in various parts of the country and is well known for his safety work throughout the industry. He has written numerous publications issued by the Bureau.

Milton C. McCall, engineer-in-charge, subdistrict office, coal mine inspection division, Johnstown, Pa., has been transferred to Birmingham to succeed Mr. Parker. Prior to joining the Bureau in 1928, Mr. McCall was employed by the Banks Coal Co. and the Pittsburgh Coal Co.

Henry R. Owens, Trucksville, Pa., mine inspector for the 11th Anthracite district, has retired after a mining career of 55 years that started as a breaker boy for the Kingston Coal Co. Mr. Owens, who retired because of health, had been an inspector for 18 years, and was president of the Mine Inspectors Institute of America from 1944 to 1946. In accepting his resignation, **Richard Maize**, Pennsylvania Secretary of Mines, complimented Mr. Owens on his excellent work and his contributions to the improvement of the industry.

Joseph F. Lawrence, Hazleton, and **John B. Reinhoehl**, Mahony City, have been appointed Pennsylvania anthracite mine inspectors by Gov. James H. Duff.

Arlen "Zach" Jennings, former operating official and consultant, Chicago, has been appointed to operate coal mines in Korea for the Army under Gen. Hodges. As a civilian employee, he will be attached to C.P.S., Hq. 24th Corp, A.P.O. 235, % Postmaster, San Francisco, Cal.

Edward Martinez has been appointed an instructor in mining engineer-

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ing at Lafayette College. Mr. Martinez, who received his BS from Columbia University in 1944, and a degree of engineer of mines from Columbia School of Mines in 1947, served in the Navy for two years during the war.

John W. Igoe, Charleroi, Pa., has joined the Bituminous Coal Research, Inc., to handle technical information service and edit the *Bituminous Coal Research Bulletin*, succeeding Carl S. Westenburg, who has resigned to rejoin the Utah Fuel Co., Salt Lake City, as technical assistant to the president. Mr. Igoe has had extensive experience in technical publicity and since leaving the Navy has been associated with Reuter & Bragdon, Inc., Pittsburgh.

Obituary

Frank A. Taylor, 65, president of the Maryland Coal & Coke Co., the Maryland New River Coal Co. and other West Virginia and Pennsylvania producing companies, died Oct. 8 at his home in Philadelphia. Mr. Taylor, long prominent in the smokeless fields of Southern West Virginia, served as president of the West Virginia Smokeless Coal Operators Association in 1937, was a director of the Bituminous Coal Producers Association of District No. 7 and a director of the recently formed Smokeless Coal Producers Association.

Herman D. Everett, 56, president of the Princess Dorothy Coal Co., Winding Gulf Collieries Co., Ridgeview Coal Co. and Smokeless Fuel Co., with offices in Charleston, W. Va., died Oct. 10, following a heart attack in the C. & O. Ry. station in Charleston. Mr. Everett was a member of the board of directors of the National Coal Association from 1943 to 1946, was a member of the NCA Marketing Committee and had served the association and the coal industry in many capacities throughout his career.

Henry C. Daugherty, 70, founder and president, Daugherty Coal Co., Finleyville, Pa., died Oct. 9 at his home.

J. Thomas Millington, 56, superintendent, Bliss colliery, Glen Alden Coal Co., Manticoke, Pa., died Oct. 7 in the Wilkes-Barre General Hospital, following a heart attack suffered the evening before at a Community Chest dinner. Mr. Millington had held supervisory positions with Glen Alden for the past 35 years, the last 20 of which as superintendent at various collieries operated by the company.

Gabriel Fischer, 64, secretary-treasurer, Lehigh Valley Coal Co.,

Wilkes-Barre, Pa., died Oct. 9, following a heart attack suffered in his office. Mr. Fischer had been associated with Lehigh Valley for 45 years, beginning his career there as a clerk in the paymaster's office.

John J. O'Leary, 66, international vice president, U.M.W.A., died Oct. 27 in St. Luke's Hospital, San Francisco, following a heart attack suffered in his hotel two days after the close of the AFL convention there. Mr. O'Leary, after starting as a miner, first became a union official in 1910 and was named international vice president in 1942.

Association Activities

Southern Coal Producers Association has elected Joseph E. Moody president. Mr. Moody, industrial relations manager for the York Corp., York, Pa., succeeds to the post vacated last December by Edward R. Burke, former U. S. Senator from Nebraska.

New River Coal Operators Association, at its annual meeting at Mt. Hope, W. Va., Oct. 9, reelected as president, J. M. McCauley, manager of mines, New River Co.; vice president, L. C. Campbell, vice president,

Coal Division, Eastern Gas & Fuel Associates; and secretary-treasurer, Stanley C. Higgins.

Controllers Institute of America, at its 16th annual meeting in Chicago, Oct. 19-22, elected as vice presidents of the group, Herbert P. Buetow, treasurer, Minnesota Mining & Mfg. Co., St. Paul, and John Pugsley, controller, Tennessee Coal, Iron & R.R. Co., Birmingham, Ala.

Kanawha Coal Operators' Association at its annual meeting at Charleston, W. Va., Oct. 21, reelected the following officers: Garner Williams, president; D. W. Martin, vice president; John L. Dickinson, treasurer; and Harry G. Kennedy, executive secretary. A business session in the morning, an afternoon devoted to sports and a banquet in the evening comprised the day-long program of the meeting, which was well attended by members and guests. The association is now 43 years old.

American Mining Congress has announced that Theron G. Gerow, executive vice president, Truax-Traer Coal Co., has accepted the national chairmanship of the program committee of its 1948 Coal Convention. The meeting, which will be a convention only and not include mining-equipment exhibits, will be held at the Netherlands Plaza Hotel, Cincinnati, April 26-27.

Fuels Conference Draws Coal-Operating Men

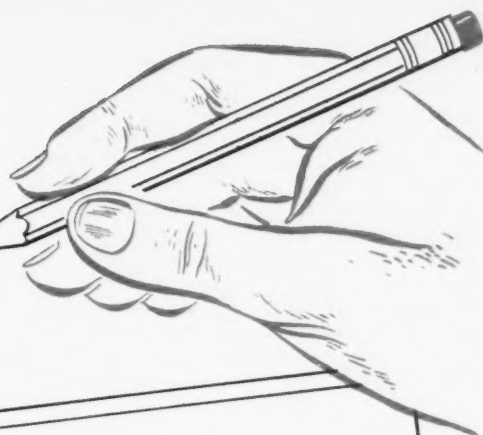
Cyclone thickening of coal slurry, a new cleaning plant, underground gasification, moisture increase due to spraying coal and sectionalizing of underground power distribution were topics of chief interest to coal operating men who attended the tenth Joint Fuels Conference of the Coal Division, A.I.M.E., and the Fuels Division, A.S.M.E., in Cincinnati, Ohio, Oct. 20-21. More than 260 men who attended the sessions saw the annual Percy Nicholls Award for scientific or industrial achievement in solid fuels presented to Howard N. Eavenson, president, Bituminous Coal Research, Inc., Pittsburgh, Pa.

The Dutch-developed cyclone thickener, having several hundred times the capacity of conventional thickeners, produces a solids content of 60 to 65 percent from slurries and recovers nearly all plus-200-mesh solids, declared H. F. Yancey, supervising engineer, U. S. Bureau of Mines, who read a paper jointly prepared with M. R. Greer, Bureau mining engineer. Since the cyclone is cheap to build and operate and has no moving parts, it should find wide application in coal washing, Mr. Yancey stated. Commenting on this paper, F. J. Fontaine,

Dutch State Mines, stressed the merits of small-size cyclones, pointing out that capacity per square foot of area drops as total area increases, and suggested use of a rubber lining at the nozzle mouth instead of hardened steel, which wears out more quickly.

The Dorrance Colliery central cleaning plant of the West Virginia Coal & Coke Corp., Stirratt, W. Va., was designed to overcome several obstacles, said T. R. Workman, vice president of the company, whose paper was prepared jointly with H. D. Bowker, preparation engineer at the plant. Among these obstacles were: (1) separate washing of minus 2-in. sizes of high-fusion and low-fusion coal, (2) handling total tonnage from No. 15 mine after No. 19 mine works out, (3) bringing in coal hauled by truck and rail from other mines, (4) blending raw run-of-mine from Upper and Lower Island Creek seams, which are mined separately, (5) separate mechanical cleaning of 7x½-in. coals from No. 15 and No. 19 mines, (6) hand cleaning of plus 7- or 8-in. sizes, (7) dry cleaning of ½x0-in. or ¾x0-in. sizes and (8) screening coals of irregular fracture from certain parts of the Island Creek seam. In addition

Actual Tests taken by Coal Inspectors on a Chance Process Installation



United Engineers & Constructors Inc.

J. O. 7077
Date 8/22/47

Daily Washery Report

Chance Cone _____ Sand 50P2 Washing Gravity 1.50

Coal Company XXXXXXXXXX Shift 1st Location XXXXXXXXXX

Time	Class.	Gravity Valve Setting				Ammeter		Circ. Pump Gauge	Trapp. Cycle	Lbs. Sand Added	Sinks in Clean Coal				Floats in Rejects						
		No. 1	No. 2	No. 3	No. 4	Sand P.	Agit.				Size	Wt. %	Size	Wt. %	Size	Wt. %	Size	Wt. %			
9:30AM	.75	1.60	1.75	1.50	1.25	38	6	20"	2 1/2"	1000	1/4x2	0.60	2x5	0.00	5x6	0.00	1/4x3/4	0.90	3/4x6	0.20	
11:30"	"	"	"	"	"	"	9	"	"	"	"	0.02	"	0.60	"	0.00	"	"	0.99	"	0.10
11:55"	"	"	"	"	"	"	6	"	"	"	"	0.03	"	0.00	"	0.00	"	1.20	"	0.40	
1:00PM	"	"	"	"	"	"	"	"	"	"	"	0.00	"	0.04	"	0.00	"	0.68	"	0.49	
1:45"	"	"	"	"	"	"	"	"	"	"	"	0.70	"	0.50	"	0.00	"	0.70	"	0.50	
2:45"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	0.89	"	0.34	
Avg.																					

Remarks:



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You may obtain similar results in your own plant by installing a Chance process. Let our engineers tell you how this can be accomplished.

to solving these problems, blending, dustproofing, freezeproofing and refuse disposal were provided for.

Features of the new plant include cross-over dumps for mine cars, two chance cones, five American twin-deck pneumatic separators, Menk dedusters, Pangborn dust collectors, a Viking hot-oil vapor system for dustproofing, three Syntron vibrating feeders for applying calcium chloride, five 600-ft. wells for emergency water supply, three Farval units for one-shot high-pressure lubrication, a freight elevator and a dial telephone system. "We have not lost a single shift of operation due to breakdown or lack of maintenance since the plant was started," Mr. Workman concluded.

Forecasting high-level fuel demands for the future, due to population growth, increasing transportation and industrial needs and a higher living standard, W. C. Schroeder, chief, Office of Synthetic Liquid Fuels, U. S. Bureau of Mines, cited the need for more efficient use of fuels and spoke of the Bureau's plans for further research in underground gasification at the Gorgas mine of the Alabama Power Co. Following Mr. Schroeder's remarks at the banquet session, M. H. Fies, manager of coal operations, Alabama Power Co., summarized experiments to date at the Gorgas mine and drew the following conclusions: (1) combustion can be maintained, burning nearly all the oxygen, in a passage of 300 ft. or less, (2) the pre-combustion coke bed is satisfactory for producer or water gas operation, if oxygen or steam can be forced through, (3) there is little or no loss in underground gasification, (4) higher temperatures over wider areas are needed for gas of maximum heat content and (5) falls of roof after burning do not stop air flow or combustion but boost back pressure on the blower. More data are needed on quantity of air and blower pressure, permeability of expanded rock after it comes down and the value of preheating the air blown in. Further work under deeper cover in larger bodies of coal should go forward, Mr. Fies stated.

Dust percentages in various sizes of coal, moisture increase due to water spraying and needs for further research were discussed by T. W. Guy, chairman, coal preparation committee, A.I.M.E., at the Tuesday afternoon meeting. Use of $\frac{1}{2}$ to $\frac{3}{4}$ gal. of water per ton at the face in mechanical mines makes preparation-plant spraying unnecessary and increases moisture from 0.5 to 8 or 12 percent, depending on size, without making screening and mechanical cleaning of $\frac{3}{8}$ x0-in. sizes more difficult, Mr. Guy reported. More data are needed on sources of dust, wettability of various coals, efficiency of wetting agents and the critical surface moisture in $\frac{3}{8}$ x0-in. sizes of high- and low-moisture content, Mr. Guy stated. D. H. Davis, product control engineer, Pittsburgh Coal Co., commenting on the paper, stressed the need for care in installa-

EQUIPMENT APPROVALS

Two approvals of permissible equipment were issued by the U. S. Bureau of Mines in September, as follows:

Joy Mfg. Co., La-Del Division—Model 1-155-12-18A portable axial-flow fan; 1 hp. a.c. motor; 220 and 440 volts, 60 cycles; or 500 volts, 50 cycles; Approvals Nos. 588 and 588A; Sept. 3.

Jeffrey Mfg. Co.—Type 61 conveyor power unit; 15-hp. motor; 500 volts, d.c., Approval No. 455A; Sept. 22.

tion of sprays, selection of cutter bits and laying out the cutting pattern for better dust control.

Falls, high humidity, water, mechanical hazards and use of bare trolley wires as main conductors distinguish electrical hazards in mining from those in other industries, declared A. L. Barrett, Joy Mfg. Co., the second speaker Tuesday afternoon. Without a sectionalized power system, a fall, for example, may knock out all underground operations, he pointed out. To provide safety and guard against complete shutdown, he urged sectionalization at the substation, between substations, at the junction of main line and main branch circuits, at the junction of branch circuits with smaller lines and at or near equipment. Except for those near equipment, circuit breakers should be automatically reclosed. The speaker also called for new-type protection for trailing cables and suggested development of a trolley-type circuit breaker. With proper sectionalizing, about 80 percent of time now lost to power outages can be regained, Mr. Barrett claimed.

Other papers, mostly on utilization, were of collateral interest to coal operating men because of their long-term significance in coal's future. These papers are summarized briefly as follows:

"Continuous Discharge Spreader Stoker," by Otto De Lorenzi, director of education, Combustion Engineering Co.—With variable speed control, this stoker burns almost any kind of coal and thus makes industrial plants independent of rigid coal specifications.

"Stability of the Atmosphere and Its Influence on Air Pollution," by H. F. Hebley, director of research, Pittsburgh Consolidation Coal Co.—Complex air movements and changes in air-mass temperatures are crucial factors in air pollution and need further study by smoke-control experts.

"Condensation Nuclei in Atmospheric Pollution," by Hans Neuberger, chief, Division of Meteorology, Pennsylvania State College—Without fine and microscopic particles, created largely by combustion and suspended in the air, there could be no rain. Reliable medical data are needed as to effects of these particles on humans.

"Relation of Free Swelling Indexes to Other Characteristics of Some Alabama Domestic Stoker Coals," by R. Q. Shotts, fuel technician, Alabama State Mine Experiment Station—Free-swelling indexes of Alabama domestic stoker coals range from $3\frac{1}{2}$ to 8. Since heat value increases with higher indexes and smaller sizes have lower indexes, removal of fines will make better stoker coals.

"Relation of Fuel to Proper Equipment Operation," by C. A. Reed, director, engineering department, National Coal Association—Small boiler-plant operators should consult qualified engineers to assure full capacity and better operation.

"Application of Anthracite Stokers," by P. F. White and C. F. Golding, service engineers, Anthracite Institute—Use of small sizes of anthracite in small plants has increased greatly in the last five years and experiments with pelletized anthracite silt points to further increases.

"Application of Bituminous Stokers," by H. L. Wagner, Detroit Stoker Co.—Stokers and furnaces can be designed for a wide range of fuels, making the small-plant operator independent of a single source of supply.

"Plant Design from a Consulting Engineer's Viewpoint," by H. N. Hermann, Harold N. Hermann Associates, Cincinnati—Small plants should be designed to use lower grade coals without operating breakdowns.

"Instruments and Combustion Control for Plants," by W. H. Pugsley, vice president, Hayes Corp.—Inclusion of automatic controls in plant design is the best way to control smoke.

"Economics of Boiler-Room Operation," by C. E. Miller, Utilities Operations Branch Office, Chief of Engineers, Washington, D. C.—Cutting labor costs with automatic controls can reduce the number of conversions from coal to oil when cost is a factor.

"Proper Application of Combustion Equipment in Smoke Elimination," by H. B. Lammers, Coal Producers' Committee for Smoke Abatement—Training of operators must be joined with automatic controls to ban smoke.

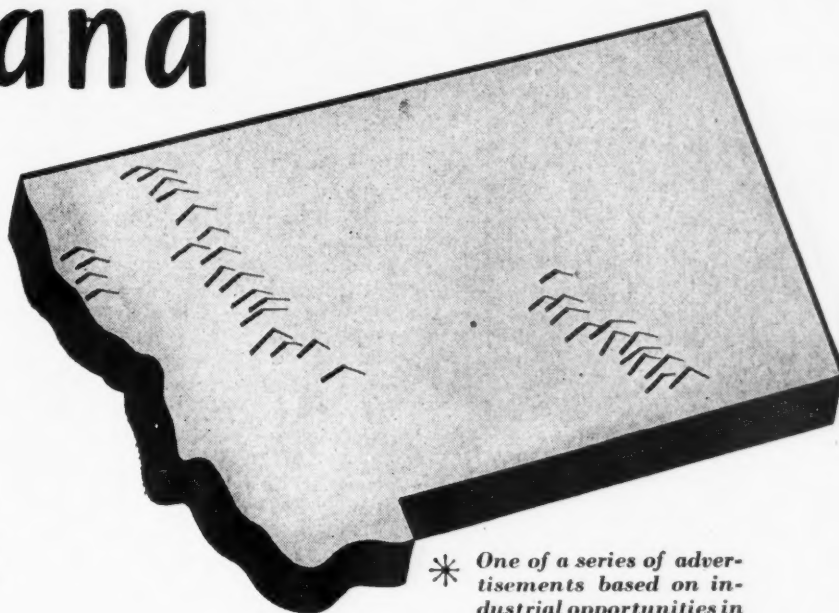
"Experience with Government-Operated Plants," by J. F. Barkley, chief, Fuels Utilization Division, U. S. Bureau of Mines—Water-tube design, the stoker's ability to burn wide ranges of coal, simple controls, coal- and ash-handling equipment and chemical treatment of feed water are important in small-plant design.

"Ohio's Fuel Situation in 1947," by R. F. Stilwell, district manager, North American Coal Corp.—Ohio uses much more fuel than it produces and uses more bituminous coal than any other state except Pennsylvania. At present rates of mining, Ohio has reserves for 450 years. Industries in Ohio are adapting plants to use more Ohio coal.



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VALUABLE WOOL CLIP
VARIED AGRICULTURE
TREMENDOUS WHEAT YIELD
SCENIC BEAUTY



* One of a series of advertisements based on industrial opportunities in the states served by the Union Pacific Railroad.

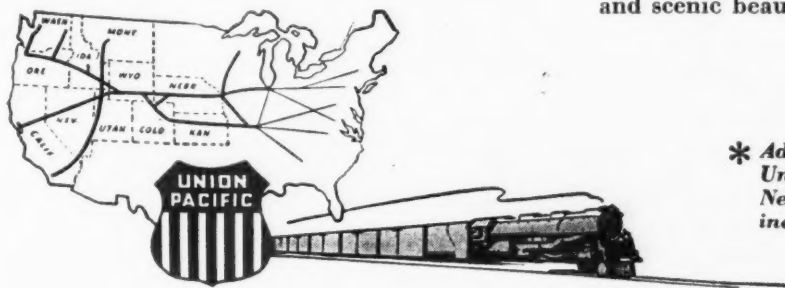
Known as the "Treasure State," Montana is richly endowed with raw materials essential to industrial production. Among the many metallic minerals are silver, copper, lead, manganese, chromium and molybdenum. Coal reserves have been estimated at over 400 billion tons. The majority of the state's cities are supplied with natural gas.

Montana is a top producer of cattle and sheep, the annual sheep production being approximately two million head with a wool clip of great value. In agriculture, wheat takes first rank among grains. Sugar

beets, potatoes, together with other vegetables, are grown on its farms. There are many thousand acres of forests, principally pine.

The Union Pacific Railroad serves Butte in the heart of the great mining area, and West Yellowstone—most popular rail entrance to the famous Yellowstone National Park.

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* Address Industrial Department, Union Pacific Railroad, Omaha 2, Nebr., for information regarding industrial sites.

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THE STRATEGIC MIDDLE ROUTE



New Illinois Mines Director Takes Over

Gov. Dwight H. Green (left), confers with Thomas Moses, appointed director of the state department of mines and minerals on Oct. 1, as Harold L. Walker, who retired from the post to return to the University of Illinois, looks on. Mr. Moses, who entered the mines at the age of eleven, was named president of the H. C. Frick Coke Co., U. S. Coal & Coke Co. and other U. S. Steel subsidiaries in 1927. From 1938 until his retirement on Jan. 1, 1946, he was vice president in charge of raw materials for the U. S. Steel Corp.

U.M.W.A. Charged With Taft-Hartley Violation

The first injunction proceedings against the U.M.W.A. were reported last month, when Judge J. Mac Swinford of the Kentucky Western District Federal Court Oct. 8 signed at Owensboro an order requiring the union and its agents in Kentucky to show on Nov. 6 why a restraining order should not be issued to forbid acts alleged in the complaint. The action was brought under the secondary boycott provisions of the Taft-Hartley Act and was the third such action to be started since the law went into effect. Assault, threats of hanging and other bodily harm as well as picketing are among the charges lodged against the international, district and local unions and district and local officers.

The complaint, filed by the NLRB for the Cincinnati area, states that the Sentry Coal Mining Co., with operations in Ohio County, Kentucky, had engaged the Jackson Construction Co., Beaver Dam, Ky., to construct facilities for a stripping operation. The U.M.W.A. asked the coal company for recognition as bargaining agent of employees who were to be hired. When their demand was refused, it is charged, union officers, appearing at the site, warned Jackson Co. employees not to continue work under threat of bodily harm. Construction employees then left the job, it is alleged, and the U.M.W.A. set up road blocks and picket lines to prevent Jackson and Sentry em-

ployees and those of another concern from going to work.

Damages of \$125,000 as a result of the boycott were previously sought by Sentry from the union in a suit filed in Owensboro, Aug. 21. (*Coal Age*, October, p. 132.)

Plan Exploitation Of Utah Coal Lands

Negotiations for a \$250,000 exploratory project on public lands in Carbon County, Utah, to increase the supply of coking coal for metallurgical use in western states have been begun between the federal government and the Geneva Steel Co. and the Kaiser Co., Inc. Funds for the project would be provided by the two steel companies and the explorations would seek to determine the amount, location and quality of coking coals available north and west of the town of Sunnyside. Coking coal already is being mined south of Sunnyside. Completion of the new project is expected to take about six months.

ICC Grants 10 Percent Rail-Freight Rate Rise

The Interstate Commerce Commission Oct. 7 granted the railroads an emergency increase of 10 percent on freight charges for all commodities except coke, coal and iron ore, for which special new rates also were set. Most increases went into effect Oct.

13, after new tariffs were filed with the ICC.

Rates for coal, including lignite, and coke were increased 10c. a net ton or 11c. a gross ton. Iron-ore rates were raised 10c. a ton, whether gross or net, except for those railroads serving the upper lake ports.

The ICC estimated that the 10-percent increase, modified by the more limited increases on coal, coke and iron ore, meant an over-all increase of 8.9 percent, which is to hold good until hearings have been held on the long-range request of the railroads for increases of 38 percent in the east and 28 percent elsewhere.

Anthracite Committee Reports on Research

Mine-water problems, basic and practical research, the projected new anthracite laboratory at Schuylkill Haven, Pa., and performance of new-type machinery in anthracite mines were the subjects of a meeting of operator members of the Anthracite Advisory Committee with officials of the Department of the Interior in Washington, D. C., Oct. 2. The conference, held in the offices of James Boyd, new director of the Bureau of Mines, was attended by Secretary of the Interior J. A. Krug, as well as anthracite operators and members of the Bureau of Mines staff.

Solution of the mine-water problem, which threatens to ruin the anthracite industry, must come from an over-all mine-flood prevention effort coordinated by the federal government, operator members stated. Bureau engineers, they point out, have found five times as many pools and ten times as much water as was expected when the recent investigation began. Although some companies are working jointly to keep their mines dewatered, the problem never will be solved individually or by small groups, they contended.

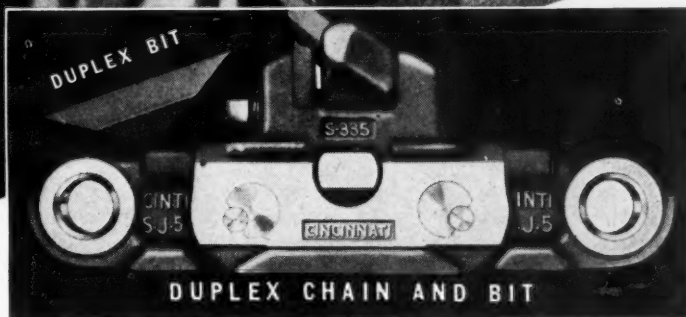
The new research laboratory is expected to be in operation within 12 months, Bureau officials stated, and will centralize control and coordinate field work on mining research, flood prevention and utilization of anthracite. The \$450,000 building is part of the Bureau's program for long-range fundamental research that will serve as a stepping stone for practical developments, according to Dr. A. C. Fieldner, chief, Fuels and Explosives Branch.

Status of projects undertaken by the Anthracite Mechanical Mining Section was summarized by J. W. Buch, supervising engineer, as follows:

1. Preliminary tests of a loading machine in the Glen Burn colliery show a capacity of as much as 150 tons of material per hour, about twice what it was designed for.

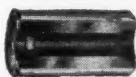
2. Tests of the Eickhoff shearing-

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machine have been completed with very favorable results.

3. Tests of a Korfmann shearing machine disclosed higher power requirements and difficulty of operation.

4. A vibrating-blade coal planer is under construction by the Bureau and is expected to be ready for trial in mines of the Lehigh Valley Coal Co. by January, 1948.

5. The Bureau is taking part in a cooperative plan to design an electrical distribution system for a mechanized underground anthracite mine that will have the longest single rubber-belt conveyor in the world.

6. Design and operation of electrical controls in two automatic underground pumping plants have been investigated and others will be made under different conditions. The objective is standardization to reduce installation and maintenance costs.

7. Early completion of a measuring device for loads born by roadway supports in anthracite mines has been predicted.

8. Completion by next summer of a design for a mobile-loading machine for anthracite conveyor mining, particularly for pillar work, has been predicted.

9. The Bureau of Mines and the Lehigh Navigation Coal Co. have completed installation of a 350-mm. (14-in) cyclone thickener at the Tamaqua colliery to check the performance of this device in thickening several kinds of washery effluent products. A survey is being made also at two breakers in the southern anthracite field to determine the performance characteristics of jigs, tables and Chance sand flotation washers on the prepared grades of coal.

Official's Retirement Regretted by Miners

Regret at the retirement of Andrew Calderwood, until recently superintendent of No. 1 and No. 3 mines of the Hatfield-Campbell Creek Coal Co., was expressed in a letter from the recording secretary of Local Union 2347, Putney, W. Va. Except for a short service as a state mine inspector, Mr. Calderwood had spent his entire mining career in the Putney area. "He has always given consideration to the members of the mine committee of this local and has never had a wildcat strike," the letter said.

Coal Shortage Follows Pittsburgh Smoke Ban

Pittsburgh's new anti-smoke ordinance, requiring that only smokeless fuels be used within the city or that smokeless stokers be installed if high-volatile bituminous is used, went into full effect at midnight, Sept. 30, following a campaign dating back almost 100 years and culminating in the new law, which was adopted in

1941. However, because of wartime scarcities, the effectiveness of the law was delayed. Within the last two years, all buildings, railroads and commercial plants have come under the smoke ban. Under the broader application of the ordinance effective recently, dwellings now are included. Thirteen smoke inspectors have been assigned to cover the 57-square mile area but it is generally admitted that the staff will have to be enlarged.

A spot check of 23 coal yards in the city on the day the law became effective showed less than 1,000 tons of high-volatile coal, about 8,500 tons of smokeless coal from central Pennsylvania and only 6,500 tons of anthracite fuel, the whole adding up to less than a two-day supply for the city under normal winter demands.

November Export Quota Below October Figure

A November coal export quota of 3,500,000 tons was announced Oct. 7 by the U. S. Department of Commerce. Three million tons of the quota is allocated to Europe and the remainder for other overseas destinations. The November figure is 550,000 tons short of the quota for October, the reduction resulting from the coal-car shortage and seasonal changes in supply requirements in the United States. In spite of the reduction, however, the November allocation to Europe is equal to its monthly average of exports during the first nine months of the year, and total shipments and forward allocations for the year still are above promised quantities, it was stated. November quotas for the neediest countries are approximately equal to their respective October allocations.

Elkhorn-Big Sandy Meet Held at Pikeville, Ky.

Teams from the Inland Steel Co.'s mines at Wheelwright, Ky., won both the first-aid and mine-rescue competitions at the annual Safety and Mine-Rescue Contest of the Elkhorn-Big Sandy Mine Institute held at Pikeville, Ky., Sept. 26-27. Roy Conley captained the winning first-aid team and Willie Rainey led the top mine-rescue team. Second place in the first-aid contest went to a group from Mine 214, Consolidation Coal Co. (Ky.), captained by Warren Harris, and second place in the mine-rescue competition was won by a team from the Coal Division, Eastern Gas & Fuel Associates, led by Jesse Dale.

In the colored division, top honors went to a group from Mine 214, Consolidation Coal Co. (Ky.), captained by Roy Gray, and second place was captured by the company's team from Mine 204, led by Clyde Cummings.

Girl- and boy-scout teams also took part in the meet. A total of \$1,720 in prizes was awarded, with top winners getting \$150.

Foreign Developments



Canada—A new \$300,000, three-story laboratory for the National Research Council will be constructed soon on the Dalhousie University campus, Halifax, Nova Scotia, to serve the three Maritime provinces of Nova Scotia, New Brunswick and Prince Edward Island. A 50-man staff will be employed at the start.

Dominion and provincial departments of mines are joining in experiments to produce gasoline from Nova Scotia coal and to gasify coal underground. Tests in the Fuels Research Laboratory in Ottawa already have shown that Cape Breton coal can produce gasoline at a cost of 5c. to 7c. a gallon when coal costs \$2.50 a ton at the mine. About 125 gal. of gasoline has been produced from one ton of Cape Breton coal.

Japan—Permission to borrow 2,829,410,000 yen for rehabilitation of coal-mining equipment and exploitation of reserves for the second half of 1947 has been granted to 25 coal-mining companies by SCAP, military government agency. Loans, after being negotiated through the Reconstruction Finance Bank, will go for mine cars and other transportation equipment, mining machinery, elevator cars for personnel, conveyors, emergency expenditures and exploitation of reserve deposits.

Great Britain—Britain is buying \$36,000,000 worth of coal-face machinery as part of a large-scale reorganization of the coal-mining industry, according to a recent announcement by the National Coal Board. At the same time, Sir Stafford Cripps, president of the Board of Trade, guaranteed British industry 24,500,000 tons of coal for the winter months.

The National Coal Board is starting 20 major enterprises, each costing \$12,000,000, for sinking new pits or rebuilding existing mines. Seventy projects for drift mines in shallow seams are expected to provide an additional annual output of 12 to 18 million tons annually by the end of this year.

Output of deep-mined coal up to Aug. 23, 1947, exceeded last year's

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- BOAT LOADERS & UNLOADERS
- CAR HAULS & BOAT MOVERS
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- COAL & COKE HANDLING EQUIPMENT
- PIG IRON CASTING MACHINES
- THORSTEN SAMPLER
- KINNEY CAR UNLOADER
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figure by nearly 4,250,000 tons and output per man-shift increased 3.9 percent in the same period. During the 17 weeks since the 5-day week began, production showed an improvement of 825,000 tons over last year's figures while men employed increased by 18,000.

Russia—Increased workers' benefits and titled ranks for mining executives are part of the recently announced incentives to induce Russian miners to remain on their jobs and reach a production goal of 250,000,000 tons annually by 1950. The new decree provides a 10-percent bonus after one year's service, 15 percent after three to five years, 20 percent after five years, 25 percent after 10 to 15 years and 30 percent after 15 years. An old-age pension of 50 percent is offered to workers who reach 50 and complete 20 years' service. Full wages during temporary disability are provided for those with at least one year's service. In addition, the tuition of miners' children attending middle and higher schools is reduced 50 percent. The government also announced insignia for each of the titled ranks of mining executives created by an earlier decree. These insignia resemble those used in other Russian civil services.

The great Donbass coal field, once occupied by the Germans and now being rehabilitated, is producing at two-thirds capacity, it is reported. To restore these mines, more than 20,000 million cubic feet of water has been pumped out, 600 miles of underground workings has been rebuilt, 157 major mines have been completely restored and 75 percent of the surface structures have been reconstructed. The manpower shortage in the Donbass area has been met by training 500,000 new workers since the liberation. Elsewhere, in the eastern coal basins, production is booming, according to reports, with output 49.3 percent higher than in 1940. Among the eastern fields now being worked, the Kuzbass basin is said to be six times as rich in coal as the Donbass basin and deposits in the new Karaganda field are estimated to be three-fourths as big as those in the Donbass. Deposits being mined northeast of the White Sea are large enough to warrant the name "Arctic Donbass."

FPC Okays Natural Gas For Philadelphia Area

The Federal Power Commission made public Oct. 12 a decision approving the grant of a permanent certificate to the Texas Eastern Transmission Corp. to carry natural gas to the Philadelphia and Appalachian areas through the Big and Little Inch pipelines. The corporation bought

the pipelines last February from the WAA and is currently operating the lines under a temporary certificate of public convenience. Coal and railroad operators, labor groups and public service and utility commissions had fought the permanent certificate on the grounds that it would "bring serious injury to the coal industry and to thousands of individuals dependent on it" and would "depart from a policy of wise conservation which should prevent the wasteful use of natural gas in areas where anthracite and other fuels may reasonably supply the needs," that eastern railroads would suffer loss of revenue from transportation of coal and other fuels; and that there was little prospect of improving the Appalachian supply, which was short last winter, if natural gas were piped to the Philadelphia region. However, the FPC held that the corporation's plans to install new compressor capacity would enable it to deliver 450,000,000 cu. ft. daily as against an estimated sales capacity of 435,000,000 cu. ft. and contracts calling for primary delivery of 420,000,000 cu. ft.

Preparation Facilities

Schrader Coal Co., Minersville, Pa.—Contract closed with Wilmot Engineering Co. for one 3½-ft.-diameter Wilmot Hydrotator for buckwheat No. 4; feed capacity, 25 t.p.h.

Exchange Coal Co., Atlas, Pa.—Contract closed with Wilmot Engineering Co. for two Type D Wilmot jigs for stove and nut coal; feed capacity, 40 t.p.h.

Franklin I. Miller, Ravine, Pa.—Contract closed with Wilmot Engineering Co. for two Type D Wilmot jigs for stove and nut coal; feed capacity, 40 t.p.h.

Stevens Coal Co., Trevorton, Pa.—Contract closed with Wilmot Engineering Co. for one 7-ft.-diameter Wilmot Hydrotator for No. 4 coal; feed capacity, 70 t.p.h.

Anthony Malho, Lavelle, Pa.—Contract closed with Wilmot Engineering Co. for one Type A Wilmot jig for stove and nut coal; feed capacity, 15 t.p.h.

Gulf Smokeless Coal Co., Tams, W. Va.—Contract closed with Wilmot Engineering Co. for one 3-ft. Wilmot Hydro-Separator; feed capacity, 40 t.p.h.

Creekside Coal Co., Ashland, Pa.—Contract closed with Wilmot Engineering Co. for two Type A Wilmot jigs for stove and nut coal; feed capacity, 30 t.p.h.

Natalie Coal Co., Natalie, Pa.—Contract closed with Wilmot Engineering Co. for one 6-ft.-diameter

Wilmot Hydrotator for No. 4 coal; feed capacity, 50 t.p.h.

Reidinger Coal Service, Paxinos, Pa.—Contract closed with Wilmot Engineering Co. for one Type D Wilmot Simplex jig for stove and nut coal; feed capacity, 20 t.p.h.

Blackwood Construction & Supply Co., Frackville, Pa.—Contract closed with Wilmot Engineering Co., for one 12-ft.-diameter Wilmot Hydrotator for No. 5 coal; feed capacity, 50 t.p.h.

Capone Coal Co., Avoca, Pa.—Contract closed with Wilmot Engineering Co., for one 2½-ft.-diameter Wilmot Hydrotator for rice coal; feed capacity, 18 t.p.h.; and one 2½-ft.-diameter Wilmot Hydrotator for Nos. 4 and 5 coal; feed capacity, 15 t.p.h.

Benedict & Sherman Surface Coal Mining Co., McArthur, Ohio—Contract closed with K. Prins and Associates for coal-preparation plant using a Prins coal washer for cleaning 100 t.p.h. of 5x0-in.; plant to be arranged for loading 5-in. lump, 1x¼-in. stoker and ¼x1/16-in. carbon, with provisions for crushing, screening and mixing, for loading various grades; capacity, 125 t.p.h., run-of-mine.

Harry E. Coal Co., Swoyersville, Pa.—Contract closed with Deister Concentrator Co. for eight Super-Duty Diagonal-Deck No. 7 coal-washing tables for cleaning No. 4 buck; two Concenco revolving feed distributors, Type CRF-105, for feed distribution to these tables; and two double-surface 4x7-ft. Leahy heavy Duty NO-Blind vibrating screens for feed sizing.

P. & R. Adds Benefits To Group Insurance

Changes adding new benefits to group insurance covering executive, supervisory, technical and confidential personnel of the Philadelphia & Reading Coal & Iron Co., Pottsville, Pa., were announced Sept. 30 by R. E. Taggart, president. Group insurance for these persons was first set up December 1, 1946.

The new changes provide for doubling the life and the non-occupational accident insurance to \$2,000 each, as well as doubling the dismemberment insurance. The additional insurance provided will cost eligible employees 16c. more per month, or a total of \$1.50 per month for the entire plan, including hospitalization, with the company paying the difference in premium rates. In addition to these changes, the new program enables upper-bracket employees to take life, accident and dismemberment insurance up to a limit of \$10,000, with the company paying the greater portion of the additional premium.

TAFT-HARTLEY ACT

Frees "Slave" Labor

THE TAFT-HARTLEY ACT is two months old. Its full meaning is yet to be determined by decisions of the National Labor Relations Board and the courts. However, on its face, the Act refutes the attacks made upon it by union leaders as hysterical and fanciful.

Management has had every provocation to reply to these attacks in kind. To the credit of the employers of this country, they have not succumbed to that temptation. They have maintained a temperate attitude toward the new law and the problems it is designed to correct. This approach is right. But it is only an approach.

Union leaders will want to settle for nothing short of repeal. Their attack on the Act has made some headway. It may be more effective as time goes on. *Certainly the Taft-Hartley law will be repealed if management just sits tight and lets union leaders continue to confuse their followers.*

Management, therefore, must implement its present temperate attitude with a program of positive action. The Taft-Hartley Act must be made to work not because management wants it, but because it is fair to labor—and management can do things right now to see that the Act works. Management can:

- I. Utilize every means at its disposal to acquaint the rank and file of union workers with the truth about the Taft-Hartley Act.
- II. Suggest amendments to the Act if experience indicates that amendments are necessary.
- III. Use the law as little as possible in settling labor disputes.
- IV. Stand firm in its refusal to bargain away the rights accorded by the Act to workers, management, and the public.

An examination of those four *must's* will show why they provide management with its best program of action.

I.

Union members do not know what the Taft-Hartley Act provides.

There is abundant proof of that statement.

While Congress was still trying to write a law that the President would not veto, FACTORY magazine

asked workers how they felt about major proposals in the pending House and Senate bills. Overwhelmingly they felt good. They were in favor of almost every individual provision that was finally incorporated into the bill and passed over the President's veto.

The same story emerged from the national opinion poll made by the Opinion Research Corporation of Princeton, N. J. and published by Look magazine after the law was enacted. It showed that union members uniformly favored major provisions of the Act, but were strongly opposed to the Act itself.

This inconsistency is easily explained. Instead of telling their members what the Act does for them, most union leaders have been condemning it as "a slave labor law" because it curtails the leaders' power and recognizes the rights of the union member and the public.

It is not a slave labor law. All of the basic rights accorded to labor by the Wagner Act of 1935 are preserved by the Taft-Hartley law. All of the unfair labor practices that were forbidden by the Wagner Act are still forbidden by the Taft-Hartley Act.

Nothing in the law impairs labor's right to bargain through representatives of its own choosing.

The Wagner Act condemned as an unfair labor practice any effort by employers to coerce employees in the selection of their bargaining representatives. So does the new law.

The Taft-Hartley Act merely recognizes rights of individual employees, of management, and of the public that were ignored by the Wagner Act.

For example, while the Taft-Hartley Act continues the workers' protection from coercion by employers, it also gives them new protection against coercion by unions. The individual worker is freed from the necessity of joining a union to *get* a job. He may still be required to join a union to *keep* his job, but not unless a majority of the workers vote for such a requirement in a government-supervised election.

Some people think the Taft-Hartley Act is weak in protecting the rights of the individual worker. They think that membership in a union should never be made a condition for holding a job. This is true. However, the Act does restore to the individual worker some rights which were blotted out under the Wagner Act, just as it does to management and the public.

A fair examination of the new law's provisions will show that they spring from one dominating purpose: i.e., to re-establish equality before the law.

For example, under the Wagner Act union leaders were free to say whatever they pleased about the employer to his employees. The employer, on the other hand, was denied freedom of speech in talking to his own employees. Now freedom of speech is largely restored.

Under the Wagner Act the employer was compelled to bargain with a certified union. Now the union must bargain, too.

Under the Wagner Act, unions alone had the right to petition for an election to determine whether the petitioning union represented a majority of the workers. Now the employer also has the right to secure an election.

These are features of the new Labor law that management must help workers understand. They must understand why the Act is not the "diabolical monstrosity" Philip Murray tells them it is.

Some companies have already started to explain these things to their workers. Techniques are well established, and they are techniques that any company can use. They include labor law digests in language workers can understand, supervisory conferences to cover points in the Act that affects the supervisor's handling of his job, distribution of reprinted articles that point out how employees benefit from the new law, editorials in plant newspapers and magazines, and advertisements in local newspapers.

II.

Management should take the lead whenever amendments to the Taft-Hartley law become necessary.

For twelve years labor leaders wilfully opposed every attempt to correct obvious abuses in the Wagner Act. We have now proved that a labor law *can* be amended. Let us be sure that management does not resort to the same obstructionist tactics labor has always used.

In carrying out its basic purpose to re-establish equality before the law, the Taft-Hartley Act makes it "unlawful...for any corporation whatever or any labor organization to make a contribution or expenditure in connection with" national elections. Corporations have long been so restrained. The novelty is the balancing restraint upon unions, which now have huge financial resources amounting to very many millions of dollars. However, the language of the Act *may* restrain the labor press from saying what it thinks about candidates, thus impinging upon the freedom of the press. Senator Taft has recognized this possibility.

If it should develop that the Act inadvertently throttles freedom of the press—or misfires otherwise—management should take the lead in securing suitable amendments to the Act. By assuming a completely stiff-necked attitude toward any and all

changes in the Wagner Act, no matter how badly needed, the dominant labor leaders and their political outriders finally brought on the sweeping revisions provided by the Taft-Hartley Act. Management must not follow that example of stupid leadership.

III.

Management will be wise if it uses the new law gently in settling labor disputes.

So far employers show no disposition to use the law excessively. That is good. An analysis of the NLRB's docket from August 22 to September 30 shows that approximately 90 percent of the cases now before the Board were filed by unions and employees—not by employers.

We have been surveying employers, asking if they will have occasion to use their right to sue their unions. The answer so far is consistently, "no." That answer frequently is accompanied by this remark, "We certainly hope not. We have no desire to conduct our labor relations in the courthouse."

The desired result should be for the Act to produce only those law suits that are matters of vital principle. As many employers have remarked, the courthouse remains the worst possible place to conduct labor relations. The best place is in the plant—by free collective bargaining between parties enjoying an equality before the law. The Taft-Hartley law will serve its most constructive role if it encourages this kind of collective bargaining.

IV.

Employers should not bargain away legal rights accorded to them by the Taft-Hartley Act.

By bargaining away rights given them in that Act, employers serve only to upset a carefully created balance of equality before the law which is an essential element of fair collective bargaining.

Also, by bargaining away rights properly accorded to them, they let down those members of Congress who, in voting for the Act, braved continuous threats of political assassination by powerful union leaders. For their statesmanship in the complicated field covered by the Taft-Hartley Act these Congressmen deserve the support and gratitude of the whole nation—of management, of labor, and of the public alike.

Fairly handled on all sides, the corrective force of the Act can be made a major bulwark of industrial freedom.



President, McGraw-Hill Publishing Company, Inc.

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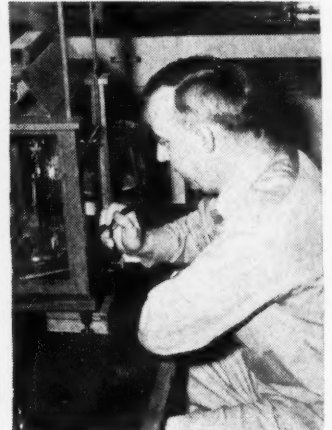
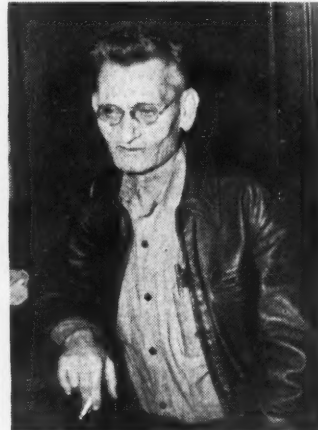


Frank Lauriski (seated, left), Dave Self, Frank Markosek, E. H. Van Wagoner, Andy Dougherty (standing, left), William Reeveley, Joe Atencio, Harry Herbert, John Cullen and C. E. Self, Sunnyside (Utah) No. 2 mine, Kaiser Co., Inc. Mr. Markosek is night foreman, Mr. Cullen is superintendent and the others are night face bosses.



J. A. Younkens (left), assistant general superintendent, and George C. Trevorrow, general superintendent of coal operations, Duquesne Light Co., Pittsburgh, Pa.

COAL MEN



Webster Lee (left) and Emil Sandeen, pit foremen, Mine No. 15, H. J. Garrison, chief electrician, and Miles G. Burns, chemist, Mines Nos. 15 & 18, Pittsburg & Midway Coal Mining Co., Pittsburg, Kan.



C. P. Turley (left), general mine foreman, Lloyd Nutter, assistant general mine foreman, C. M. Bailes, safety director, and Lundy Griffey, section foreman, Crichton No. 4 mine, Johnstown Coal & Coke Co., Nettie, W. Va.



G. E. Moore (left), vice president, and Sam G. Moore, president, Moore Coal Co., Devonia, Tenn.

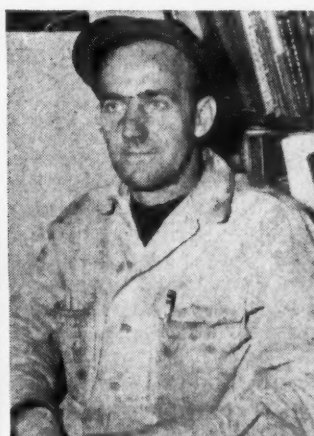


Dave Ward (left), chief engineer, and J. C. Cassells, auditor Sycamore Coal Co., Sycamore Coal Corp., Cinderella Coal Corp. and Hamill Coal Corp., Cinderella, W. Va.

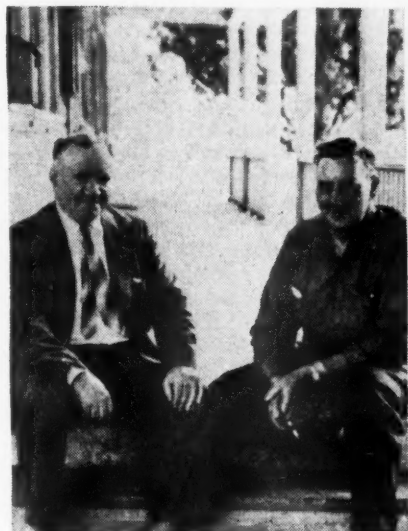


D. Smith (seated, left), Van Alger, Vernon Ezell, Mark Jeffs (standing, left), Tom McCourt, Otto Thompson, Louis Gaggini, Ross Johnson, Floyd Tucker and Frank Davis, Sunnyside (Utah) No. 2 mine, Kaiser Co., Inc. Mr. McCourt is general mine foreman and the others are day face bosses.

ON THE JOB



Roy Boyce (left), chief clerk, John Payne, mine manager, H. Goehner, top foreman, and Charles Patton, chief electrician, St. Ellen mine, Perry Coal Co., O'Fallon, Ill.



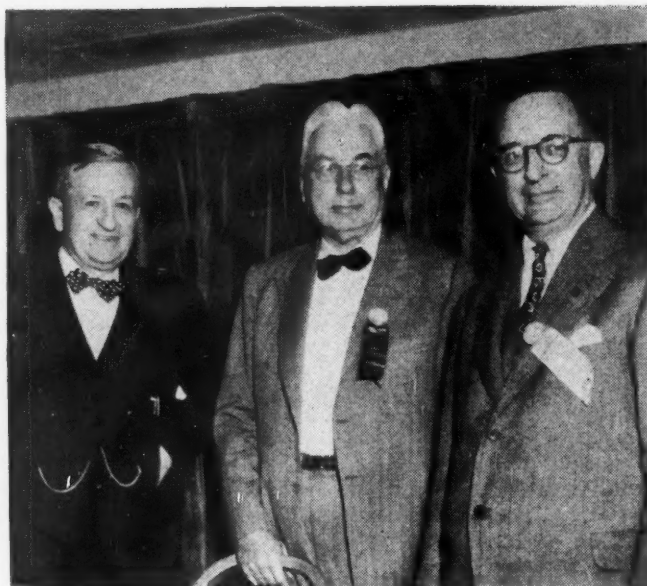
L. E. Brown (left), retired Westinghouse representative, with Earl Warren, master mechanic, Utah Fuel Co., Castlegate, Utah.



Carl Armstrong (left), foreman, "C" mine, W. H. Sharp, mine superintendent, M. J. Sharp, general superintendent, and Clay Cupp, foreman, "B" mine, Regal mine, Southern Collieries, Inc., Lake City, Tenn.



Fred S. McConnell (left), president, Enos Coal Mining Co., retiring NCA president, and L. Ebersole Gaines, president, The New River Co., newly elected president of the association.



John D. Battle (left), NCA executive secretary, Mr. McConnell, and E. R. Keeler, president, Franklin County Coal Corp., who presided at the opening session of the meeting.

NCA Drafts Broader Program

PROGRESS REPORTS on Coal-Heating Service, the coal-fired gas-turbine locomotive and training men for coal mining, a warning that early exhaustion of reserves of petroleum and natural gas soon will place new responsibilities on the bituminous industry and a discussion of the impact of coal exports on domestic and world-wide economists were spotlighted at the 30th Anniversary meeting of the National Coal Association at the LaSalle Hotel, Chicago, Oct. 16-18. In addition, the more than 500 coal-company operating and sales executives attending the sessions voted to merge the activities of Bituminous Coal Institute into the NCA program and to raise the dues to 1c. per ton. L. Ebersole Gaines, president, The New River Co., Mt. Hope, W. Va., was elected president to succeed Fred S. McConnell, president, Enos Coal Mining Co., Cleveland, Ohio.

At the opening session of the convention Thursday morning, H. C. Woods, chairman, committee on arrangements, and chairman of the Board, Sahara Coal Co., Chicago, presented E. R. Keeler, president, Franklin County Coal Corp., Chicago, who presided over the morning meeting. After an address of welcome by Mayor Kennelly, Mr. McConnell led off in the business part of the Thursday morning meeting. Marking the end of his fourth year as the association's president, he declared that the bituminous industry now is showing a willingness to join in enterprises for the good of the entire industry, being convinced that what is good for the industry at large is good for all its

members in the long run. "It is my earnest hope," he stated, "that there shall be no abatement in our vision and in our efforts but that both shall increase. I believe that we are in a test period for our industry and that we can meet this test only by a statesmanlike conduct of our affairs."

The report of Association Treasurer R. H. Knode, president, Stonega Coke & Coal Co., Philadelphia, Pa., indicated a sound financial structure but predicted increased operating costs and an expanded and more costly program for the coming year. R. L. Ireland, chairman, committee on employee relations, and president, Hanna Coal Co., Cleveland, Ohio, reported on some of the recent developments in employee relations that bear directly on the coal industry, including the new Taft-Hartley Act, the portal-to-portal act, legislation on welfare funds, the possibility of an upward revision in minimum wages and attempts to include the federal safety code in the criminal statutes.

Upgraded state laws and inspections, cooperation of unions, maintenance of the present technical research and advisory functions of the U. S. Bureau of Mines and the preservation of management's responsibility were listed as needed steps to improve safety in the mines by L. C. Campbell, vice president, Coal Division, Eastern Gas & Fuel Associates, Pittsburgh, Pa., who reported for the association's safety committee. A vigorous protest against further entrance by the federal government into competition with private industry and further subsidy of power sources that

compete with coal was voiced by Grant Stauffer, president Sinclair Coal Co., Kansas City, Mo., and chairman of the committee on government subsidies of competing energies. Mr. Stauffer's remarks were read in his absence by John D. Battle, executive secretary, National Coal Association. Charles A. Owen, president, Imperial Coal Corp., New York City, and chairman of the association's committee on interstate and foreign commerce, reviewed the activities of his group and its problems, including car shortages and car service, railroad equipment, allocations and employees.

Looking back over the 30-year history of the National Coal Association, Mr. Battle summarized the industry's achievements and its present needs, the latter including greater safety, improved merchandising, more research, a fair profit, continued education of the public, greater efforts to show the miner his stake in the industry and increased training of young men for coal mining. The industry's immediate problems, he pointed out, are the proposed St. Lawrence Seaway, the expansion of natural-gas pipelines and the growth of government-subsidized competition with private business. A sound peace, Mr. Battle concluded, must be built on a strong industrial America and that means that the coal industry must be strong.

Educating workers to be articulate about their jobs and the system of free capitalistic enterprise that provides good jobs was the theme of Arthur H. Motley, president, Parade Publications, New York, who spoke at the luncheon Thursday. Business, including the coal industry, must learn

to use the same enthusiasm and technique in selling the capitalistic system that it uses in selling its products, the speaker said in pointing out the value of personalization and localization in putting over an idea.

"No young man has to travel very far from home to find a college course in mining engineering," said M. D. Cooper, manager of vocational training, National Coal Association, and the first speaker on the Thursday afternoon program. Mr. Cooper was presented by D. H. Pope, president, Sheridan-Wyoming Coal Co., Inc., Monarch, Wyo., who presided over the session. Drawing conclusions from a year's study of programs for mining education in high schools and colleges throughout the nation, Mr. Cooper recommended, among other things, a committee of coal operators in each state to consult with colleges offering mining courses, creation of opportunities for summer employment in the mines for college students of mining engineering, visits by teachers and students in high schools to nearby mines and a genuine show of interest by local coal operators in the schools of the district. Mr. Cooper stressed the wide-open opportunity for the coal industry to develop cooperation with schools and colleges and thus to attract to mining the young men who will be needed for further mechanization of coal mining.

In the discussion following Mr. Cooper's address, Mr. Gaines, noting that the industry's training program is starting from scratch, cited two advantages of continued training activity: (1) an increased reservoir of engineers and operating men and (2) an improvement in local public relations by educating teachers and the general public in the significance of the coal industry. Charles O'Neill, president, United Eastern Coal Sales Corp., New York, reviewed the summer courses for mining men at St. Francis College, Loretto, Pa., the first session of which was completed in August, 1947. Of 47 supervisory men enrolled at the start, 44 finished the six-weeks course in economics, mining methods, physics and English. The course was made possible by cooperation of the college officials and faculty and a grant of \$50,000 from the Central Pennsylvania Coal Operators' Association. Men who took the course were subsidized by their companies. Concluding his remark, Mr. O'Neill cited about 28,000 supervisory men in the coal industry who need this kind of training.

Continuing comment on Mr. Cooper's address, Mr. Pope cited the experience of his company in conducting high-school teachers through the company's mines and efforts to persuade young men to study engineering in college. Mr. H. C. Wood declared that for a company to offer scholarships was not enough, but that the company must create interest among young men in coal mining to get men who can be trusted with the capital

NCA OFFICERS

President — L. Ebersole Gaines, president, The New River Co., Mt. Hope, W. Va.

Vice Presidents—Charles A. Owen, president, Imperial Coal Corp., New York; K. A. Spencer, president, Pittsburgh & Midway Coal Mining Co., Kansas City, Mo.; Laurence E. Tierney Jr., president, Eastern Coal Corp., Bluefield, W. Va.

Treasurer—R. H. Knode, president, Stonega Coke & Coal Co., Philadelphia, Pa.

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Executive Committee—L. Ebersole Gaines; O. L. Alexander, president Pocahontas Fuel Co., New York; L. C. Campbell, vice president, Coal Division, Eastern Gas & Fuel Associates, Pittsburgh; C. C. Dickinson, president, Dickinson Fuel Co., Charleston, W. Va.; J. D. Francis, president, Island Creek Coal Co., Huntington, W. Va.; Geo. B. Harrington, president, Chicago, Wilmington & Franklin Coal Co., Chicago; R. L. Ireland, president, Hanna Coal Co., Cleveland; R. E. Jamison, president, Jamison Coal & Coke Co., Greensburg, Pa.; R. H. Knode; Fred S. McConnell, president, Enos Coal Mining Co., Cleveland; Charles A. Owen; and Grant Stauffer, president, Sinclair Coal Co., Kansas City, Mo.

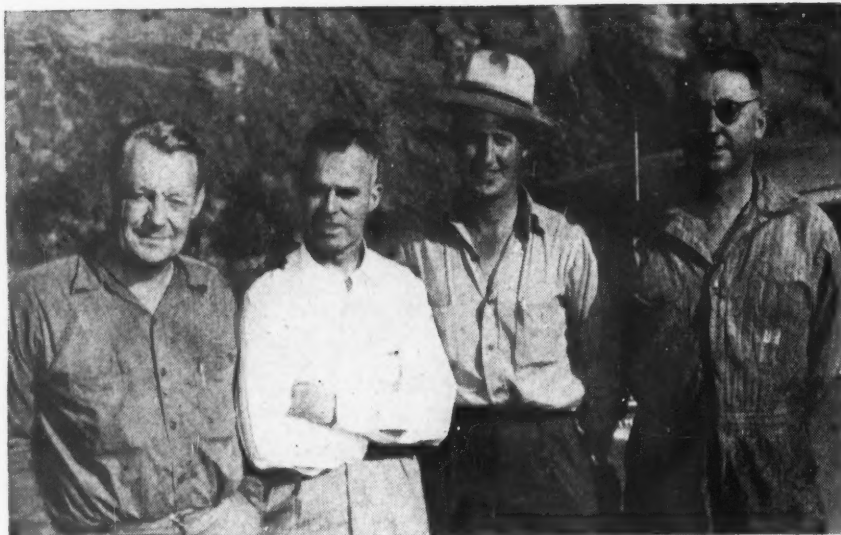
investment represented by machines. Mr. Ireland summarized the Hanna Coal Co.'s training program for high-school boys, which involves furnishing mining equipment for classroom and shop study, and cited the increase in the number of miners' sons who go into coal mining as a result of this training. W. E. E. Koepler, secretary, Pocahontas Operators' Association, reviewed vocational training in the Pocahontas field as an example of what a local operators' association can do to provide a backlog of trained young men for the industry, and cited the cooperation of the local school boards in setting up the program. Elmer Kaiser, assistant to the president, Bituminous Coal Research, Inc., Pittsburgh, Pa., pointed to the critical shortage of fuel engineers and urged an awakened interest in this field.

Concluding the floor discussion on training, Prof. Harold L. Walker, head, Department of Mining and Metallurgical Engineering, University of Illinois, Urbana, Ill., declared that four major groups of people need education in the coal industry: (1) vocational education advisers, who often steer students away from

coal mining; (2) the parents, who often oppose a career in coal mining; (3) the professional people and newspaper editors, who favor white-collar jobs; and (4) young men themselves, who often prefer the falsely romanticized fields of gold, silver or iron mining. The most immediate problem, he contended, is the education of present supervisory personnel. Training, Dr. Walker concluded, must be mapped after study of the requirements of the coal industry, which needs more mechanical, electrical and chemical engineers than mining engineers, and young engineers must be offered attractive pay for their skills.

Announcement that the \$250,000 special fund for the study of continuing underground mining methods and equipment was more than 80 percent subscribed was made by Dr. Harold Rose, vice president and director of research, Bituminous Coal Research, Inc., the second speaker at the Thursday afternoon session. Dr. Rose described the 1947-48 model of the new smokeless stove developed by BCR and told the story of the engineering and production difficulties that slowed down its development. The stove will be in limited commercial production this winter, he stated. The speaker also reported progress in abating industrial smoke, showed booklets on over-fire air jets now available from BCR and listed projects under development by the research agency, including residential-heating equipment, home design, steam locomotive performance and industrial steam and non-steam uses of coal. Dr. Rose pointed out the rapidly growing energy requirements of the nation and the limited known resources of oil and natural gas, and concluded by predicting an increased reliance on coal for heat, power, chemical materials and synthetic oils.

The coal-fired gas-turbine locomotive will be on the rails in 1948, said John I. Yellott, director of research, Locomotive Development Committee, Baltimore, Md., who spoke next on the Thursday afternoon program. Mr. Yellott reviewed progress in tests of a scalemodel turbine at the Dunkirk (N. Y.) plant of the American Locomotive Co. and announced plans for full-scale tests within a month at the Kaiser Steel Works at Fontana, Calif. This new type of locomotive, Mr. Yellott said, will burn only 1 lb. of coal for every 3 lb. now burned by conventional steam locomotives and will produce an efficiency of about 25 percent at the generator coupling and 20 percent at the rails. Although the diesel-electric locomotive has a higher thermal efficiency, the higher cost of oil per B.t.u. will make its operating cost about three times that of the gas-turbine locomotive. Looking beyond the new-type locomotive, Mr. Yellott declared that future application of the coal-burning gas turbine may be made also in stationary plants where water is at a premium



Australian Mining Men Tour U. S. Operations

TWO AUSTRALIAN VISITORS on a tour of United States coal-mining properties are snapped at a western Kentucky mining operation. Hosts and guests are (left to right): Frank Hall, Goodman Mfg. Co.; George H. Laing, colliery manager, J. & A. Brown & Abermain Seaham Collieries, Ltd., Sydney, Australia; Frank W. Gilbert, superintendent, Homestead Coal Co., Madisonville, Ky.; and S. H. Wilkinson, assistant superintendent of collieries, J. & A. Brown & Abermain Seaham Collieries, Ltd.

and in marine propulsion. As for competing sources of energy, atomic energy will be competitive only in the distant future and in extremely large installations, Mr. Yellott predicted, and dwindling supplies of petroleum and natural gas indicate that the nation will be looking to coal for its energy reserve within the next ten years, with unprecedented demands for synthetic liquid fuels. At an annual consumption rate of 600,000,000 tons, he pointed out, the known supply of coal will last 5,472 years. If, to the coal consumption at the 1943 level, the coal equivalent of the 1943 natural gas consumption (4.1 billion cubic feet) is added, coal reserves will be reduced to 4,079 years. In addition, supplying synthetic oils made from coal at the estimated level of demand for petroleum in 1960 (2.1 billion barrels) will leave the nation still with 2,000 years of coal reserves. Thus, Mr. Yellott concluded, the nation must look to coal for its energy needs within the next decade.

Warning that "unbridled installation of domestic oil burners, diesel locomotives and oil-burning prime movers for stationary service" threaten national security, Earl C. Payne, consulting engineer, Pittsburgh Consolidation Coal Co., New York, and chairman, motive power committee, BCR, called for fuel planning on a national scale as a protective measure against exhaustion of oil and gas reserves. Such a planning board, made up of representatives of the coal, gas and oil industries and the Department of the Interior, should formulate a long-term national fuels policy and pub-

licize the facts about possible wartime needs of the army, navy and air forces, self-propelled projectiles domestic heating, trucks, automobiles, commercial aviation, stationary power plants and diesel locomotives.

Pointing out that since 1920 the number of steam locomotives has decreased by 42 percent, or 27,000, while diesels rose from none to 4,441, Mr. Payne declared that 2½ steam locomotives are retired by one large railroad for every road diesel placed in service, with an annual loss of 18,000 to 20,000 tons of coal for each diesel placed in passenger service and 27,000 to 30,000 tons for each diesel that goes into freight service. Railroads are encouraged to install more diesels because of the low quality of railroad coal supplied since the war, Mr. Payne concluded. Between 1920 and 1940, improvement in traffic management and modernization of steam motive power kept coal consumption per 1,000 gross-ton miles at a low level. During this period, the speaker said, the coal ranged from 8 to 10 percent ash and the size consist of run-of-mine was about 33 percent minus ¾-in. However, since the war, consumption per 1,000 gross-ton miles has risen to 20 percent above the 1940 figure and the coal ranges from 12 to 15 percent ash and run-of-mine is about 50 percent minus ¾-in., with more than 40 percent of the supply coming from strip mines.

The kind of coal the railroads now are getting should go to utilities, which are equipped to burn fines and high-ash coal, and better coal, double-screened and more uniform in quality, should go to the railroads, Mr.

Payne contended. In fact, research projects now under way in locomotive air supply, over-fire air jets, effect of fuel on locomotive performance, handling railroad coal and reduction of cinder formation will be nullified unless the bituminous industry improves the quality of locomotive fuel, Mr. Payne concluded.

"What's Ahead in Coal Exports" was the subject of Charles A. Owen, president, Imperial Coal Corp., New York, and president, Coal Exporters Association of the United States, who spoke at the Friday morning session. Mr. Owen was presented by L. N. Thomas, president, The Carbon Fuel Co., Charleston, W. Va., who presided. Reviewing the history of the exporters' organization, Mr. Owen predicted that total bituminous exports for this calendar year probably would exceed 40,000,000 gross tons. "Food and coal are the essence of European recovery," the speaker declared. "If Western Europe is to be saved from Communism, the United States must furnish sufficient fuel and food to keep these countries from collapse." Mr. Owen contended that if present production levels are maintained in this country for a total of 600,000,000 tons, which appears likely, we can export the predicted tonnage of 40,000,000 tons and still have 48,000,000 tons more for our own use and Canada's than we had in 1946. In view of this situation, producers should oppose further reduction in monthly export quotas, Mr. Owen concluded.

"The potential level of coal exports is in excess of the figures in the 16-nation report recently released in Paris," said Col. R. P. Koenig president, Ayrshire Collieries Corp., Indianapolis, Ind., in commenting on Mr. Owen's address. The estimates are not firm figures, Col. Koenig stated, but are certain to vary with demand, productive capacity, ability to transport, money to buy and the willingness of American exporters to sell coal in the light of business conditions at home and political developments abroad. The requirements outlined in the Paris report probably are less than actually needed to maintain industrial activity at the planned level and the coal-producing nations probably have overestimated their own ability to reduce their needs for imported coal, he concluded.

The work of Bituminous Coal Institute in achieving a better informed and more constructive public opinion for coal was summarized by Ralph C. Mulligan, director of public relations for BCI, Dr. Edmond Speare, educational director, and Harold F. Douglas, vice president, Benton & Bowles, Inc., New York. "Our industry, like other industries, must continue to let people know that it seeks to be progressive and forward looking and is seeking to do a good job; that it seeks to see to it that the people who work in it are well treated; that it seeks to make only

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FIRST! because they LAST!

The on-the-job lasting ability that identifies B-G Standardized Belt Conveyors is in large part due to these B-G all-welded tubular steel belt carriers. Protected from dust and grit by "four-pass" grease seals, their bearings—roller, ball or plain as the job requires—keep them rolling smoothly with minimum maintenance.

Heavy die-formed support brackets are welded to the self-cleaning base. And along with Barber-Greene sturdiness, B-G Belt Conveyors bring you the advantages of standardized design: selection of the right one for the job and erection on the job are simplified. See your Barber-Greene distributor or write Barber-Greene Company, Aurora, Illinois.



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DITCHERS

Less lubrication—longer belt life with idlers on Timken bearings

THE easier the idlers roll, the less wear and tear on your conveyor belt. The less lubrication your idlers require, the more time and manpower you save for productive work.

Barber-Greene assure you both advantages in their heavy-duty idlers through the use of Timken tapered roller bearings. Timken bearings are

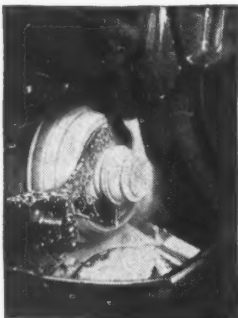
designed to roll easily and to keep rolling easily under the toughest loads and conditions. Because Timken bearings make tighter closures possible they effectively retain lubricants, keep out dust and dirt.

Remember, no other bearing combines *all* of the Timken bearing's advantages. Whether you use or make conveyor belt idlers or

any other kind of machinery where wheels and shafts turn, look to The Timken Roller Bearing Company for bearings that give you friction-free performance, long life, and ability to stand up under the tough loads. The Timken Roller Bearing Company, Canton 6, Ohio.



This symbol on a product means its bearings are the best.

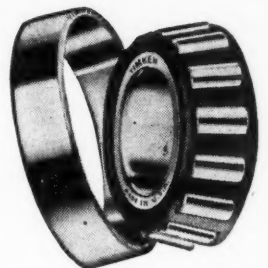


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Finishing to incredible smoothness accounts for much of the precise, smooth rolling performance of your Timken bearings. It's typical of the amazingly accurate manufacturing and inspection methods you find at The Timken Roller Bearing Company.

The Timken Roller Bearing Company is the only bearing manufacturer in the country which makes its own steel, and is the leader in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis steels.

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NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION



Meatless Tuesday 500 Ft. Underground

OFFICIALS and customers of the Susquehanna Collieries Division of the M. A. Hanna Co. meet for lunch on the 500-ft. level of the company's Maysville mine, Shamokin, Pa.

reasonable profits," Mr. Mulligan declared. Tools for this task, he pointed out, are advertising, press and radio contacts, brochures and pictorial booklets, personal calls, direct mail, an information service, films, etc., all of which BCI is using.

Dr. Speare, reviewing the activities of his educational group in contacting teachers and superintendents, libraries and universities, civic clubs, boards of education and professional societies, asked for an enlarged panel of coal operators and sales executives for the Speakers' Bureau to fill speaking engagements before such groups. Continued work is being done to correct errors and mistaken points of view in school and college textbooks, he concluded. Mr. Douglas spoke on the four types of reader aimed at in BCI's advertising: teachers, editors and publishers, people in the coal business and the public in general. Advertising media are selected for their ability to reach these groups, bearing in mind the limitations of BCI's advertising budget and the industry's need to reach the best educated and most intelligent families and groups, Mr. Douglas said.

Comment from the floor on Mr. Mulligan's presentation of the work of BCI was offered by Mr. Ireland, who urged that the industry exploit its own public-relations resources and cooperate with BCI by spreading the facts through operating managers, salesmen and others who daily reach the public: by J. D. Francis, president, Island Creek Coal Co., Huntington, W. Va., who stressed the need for public-relations activity at the local-association level and in regional associations; by H. C. Woods, who mentioned cooperation by personnel of the Sahara Coal Co., in the BCI Speakers' Bureau; and by Homer D. Jones, president, Western

Fuel Co., Chicago, and director, American Retail Coal Association, who offered the cooperation of retailers in building better public relations for the industry.

Promotion of land reclamation in areas where it already is under way and spreading the campaign to other regions was cited as the purpose of the NCA. Land Use Committee by T. C. Cheasley, who, with his associates on the committee, outlined progress to date in reforestation, grazing and other diversified restoration projects on stripped lands. Mr. Cheasley and his group, including Larry Cook, Ohio Reclamation Association; J. W. Bristow, Illinois Coal Strippers' Association; R. T. Laing, Mineral Producers' Association of Pennsylvania; L. E. Sawyer, Indiana Coal Producers' Association; and Orel E. John, Reclamation Development Co., were presented by Mr. Ireland, chairman, Land Use Committee. Mr. Laing discussed regulatory and punitive state laws now affecting strippers in West Virginia, Ohio and Pennsylvania and predicted further moves by state and local bodies to restrict stripping operations. Mr. Sawyer, Mr. Bristow and Mr. John, using slides to show what is being accomplished, stressed forests, pasture land and recreational parks as practicable uses for mined-out areas.

The Friday afternoon session, presided over by Mr. Owen, was earmarked for the progress report of Coal-Heating Service, a merchandising plan for producers and retailers that developed from action of the NCA at its Cleveland meeting in March, 1946. Leading off, B. R. Gebhart, vice president, Chicago, Wilmington & Franklin Coal Co., Chicago, and chairman of the NCA Marketing Committee, stated that Coal-Heating Service groups now are established and operating in 25 com-

munities scattered over the nation, with a total volume of about 15,000,000 tons representing in the aggregate, about 75 percent of the total retail tonnage in the areas covered. In the reasonably near future, some 40 additional communities will be served by the organization with a probable total of 35,000,000 tons, he predicted.

Aside from formal groups, unorganized merchant in other cities, inspired by the principles and practices of Coal Heating Service, are improving their merchandising and service techniques to the benefit of the industry at large, Mr. Gebhart pointed out. To date, he reported, about \$290,000 has been spent by the NCA Coal Heating Service Division, with contracts for matching the funds of local retail organizations amounting to about \$200,000 per year. With rapid growth expected in the next 12 months, Coal Heating Service will need approximately \$750,000 for the next year, Mr. Gebhart concluded.

New returns from Coal Heating Service in the form of improved public relations for the bituminous industry were reported by H. A. Glover, vice president, Island Creek Coal Co., Huntington, W. Va., and a member of the Marketing Committee. Local organized groups, with their improved information about the industry, are able to help locally in the solution of mutual problems such as short supplies, work stoppages, etc., as well as to pass on information about coal's problems and accomplishments, he declared. Turning to the setting up of Coal Heating Service groups in smaller towns, Mr. Glover urged that salesmen be indoctrinated in the principles and methods of the plan so that they can inform retailers in these areas. "Considering the shortage of oil and natural gas predicted for the next two years, coal has an opportunity to entrench itself in the home-heating market. For this the continuation of Coal Heating Service and its growth are essential," Mr. Glover concluded.

Winding up the Friday afternoon session, the convention adopted without dissenting vote a resolution earlier approved unanimously by the Board of Directors, calling for: (1) the consolidation of Bituminous Coal Institute with the National Coal Association as a department of the Association, (2) payment of the new department's costs from dues collected by the NCA, (3) retention of the present Policy Committee of the Institute as an advisory committee on policy and management, (4) earmarking of unexpended funds of BCI as a separate fund for supplemental public relations activities of the sort now being performed by BCI, (5) creation of a Finance Committee to allocate income of NCA to general expenses of NCA, the Coal Heating Service Division and the



PART of the 600 mining men who packed the Turban Room of Melody Manor, near Fairmont, for the annual banquet of the Central West Virginia Coal Mining Institute, Sept. 20. More than 200 prizes were distributed to the holders of lucky tickets.



SPEAKER for the evening was Arch J. Alexander, chief, West Virginia Department of Mines, who praised operations in the state for lowering lost-time accidents.



OFFICIATING at the drawing for the prizes, George McCaa, superintendent, Mine No. 63, Consolidation Coal Co. (W. Va.), Monongah, was kept mighty busy.

Central W. Va. Group Holds Annual Banquet

Six hundred members and guests attended the annual banquet of the Central West Virginia Coal Mining Institute, Saturday evening, Sept. 20, in the Turban Room of Melody Manor, near Fairmont. Arch J. Alexander, chief, West Virginia Department of Mines, in a brief talk, praised the local institute and the coal industry of the state for lowering lost-time accidents.

A feature of the evening was the presentation of more than 200 prizes, donated by business houses in Fairmont and other towns of the section, to the lucky holders of door stubs drawn from a box on the stage. The prizes ranged from neck ties to electrical appliances such as radios, roasters, clocks and lamps. The program also included a floor show by a professional troupe from Pittsburgh.

This sectional institute reportedly is the largest in the state, and attendance at this banquet exceeded that of any previous one held by the institute. Regular meetings, which emphasize mine safety and operating efficiency, are held at various places in northern West Virginia. George R. Higinbotham, vice president, Consolidation Coal Co. (W. Va.), is president of the institute, and Arthur E. Belton, also of Consol, is secretary.

of McAlester in an area where commercial coal mines have been operating for some time. The coal is classified as high-grade bituminous, suitable for blending with other coals to make coke, and minable coal is estimated at more than 769,000,000 tons. Ratification will end 45 years of government trusteeship of the lands and will open the area for development by private capital under private land mining and mineral leasing laws.

new public-relations department and (6) establishment of dues of 1c. per ton for the fiscal year ending Sept. 30, 1948. The resolution was offered by Heath S. Clark, president, Rochester & Pittsburgh Coal Co., Indiana, Pa.

At the concluding session Saturday morning, Mr. McConnell presented L. Ebersole Gaines, new NCA president, who expressed confidence in the future of the industry and surveyed the broader sphere of activity lying ahead of the association. A report on tax matters, including problems of definition of net income from property, net operating loss deduction, definition of mineral property, percentage depletion and social security was made by Lovell H. Parker, chairman, Special Tax Committee, NCA. The final report of the convention was made by James Holey, association counsel, who discussed imminent changes in the Wages & Hours Law.

New directors of the association

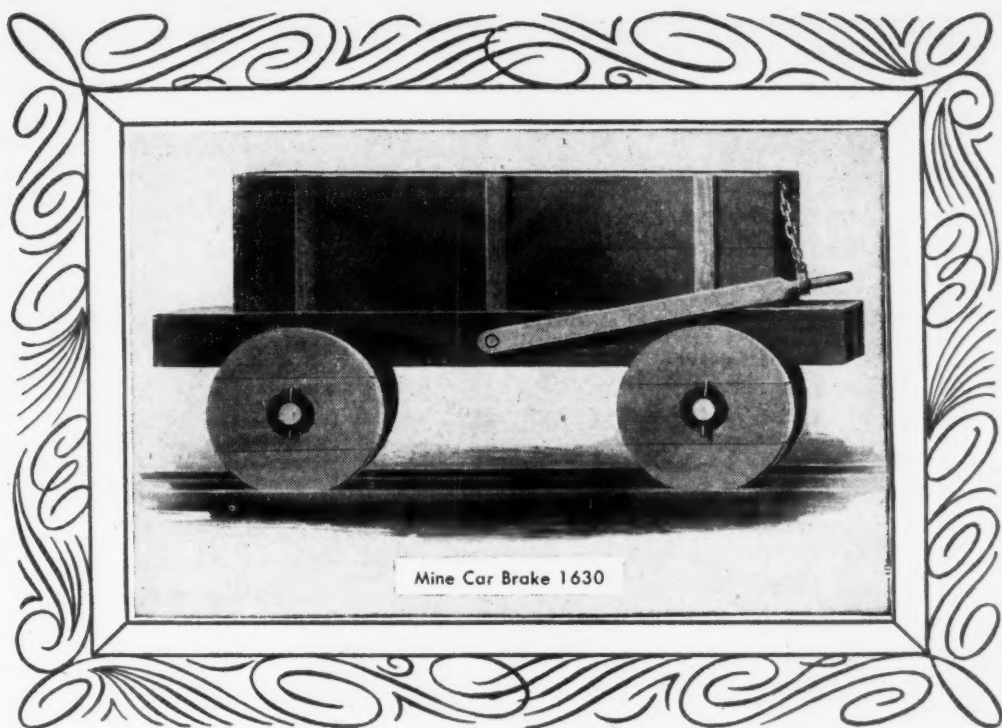
were elected as follows: Charles R. Griffith, president, Southern Coal & Coke Co., Knoxville, Tenn., to succeed E. C. Mahan, chairman of the board of the same company, who resigned after 28 years as a member of the NCA board; and F. A. Fontyn, president, Edensburg Coal Co., Philadelphia, Pa., to succeed G. Dawson Coleman, chairman of the board of the same company, who recently resigned as an association director.

Government Buys Indian Coal Land in Oklahoma

The federal government Oct. 8 contracted to purchase 300,000 acres of southeastern Oklahoma coal and asphalt lands from the Choctaw and Chickasaw Indian Nations, at a price of \$8,500,000, subject to ratification by the Indian nations and by Congress. The tract lies east and south

Welding Group Offers Student Awards

The James F. Lincoln Arc Welding Foundation has announced rules and conditions for the 1947-48 competition for scholarships and awards. The contest is one of a 10-year series which provide \$6,750 annually for engineering students and institutions. The Award Plan offers 77 prizes totaling \$5,000, topped by a single \$1,000 award, to engineering students who submit papers on arc-welded design. The scholarship funds, totaling \$1,750, are awarded to departments of the institutions in which award winners are registered. The contest closes May 15, 1948. Copies of the rules governing competition may be obtained from the James F. Lincoln Arc Welding Foundation, Cleveland 1, Ohio.



HOW FAR has your braking equipment come in *300 years?*

The family portrait above shows one of the earliest ancestors of today's coal transportation system. An enterprising mine owner at Newcastle-on-Tyne laid wooden rails for the cars, added a pivoted lever to serve as a brake.

Mine transportation has come a long way since, with powerful electric locomotives that haul long trips at almost express-train speeds. But in too many mines, brake progress hasn't kept in step, and slowing and stopping still depends on muscle.

Westinghouse Hydraulic Brakes for mine locomotives gear braking equipment with today's high mechanization and high-speed transportation. Parts are compact, fit into available space on locomotives. Braking pressures are automatically graduated according to positioning of valve handle, giving top flexibility in control. Sound design and rugged construction assure dependable service under punishing conditions.

Users report Westinghouse Hydraulic Brakes stop motor bucking and similar abuse, soon pay for themselves in reduced maintenance and repairs. They improve haulage efficiency, speed operations. Ask for Bulletin S.P. 9092.



Westinghouse Air Brake Co.



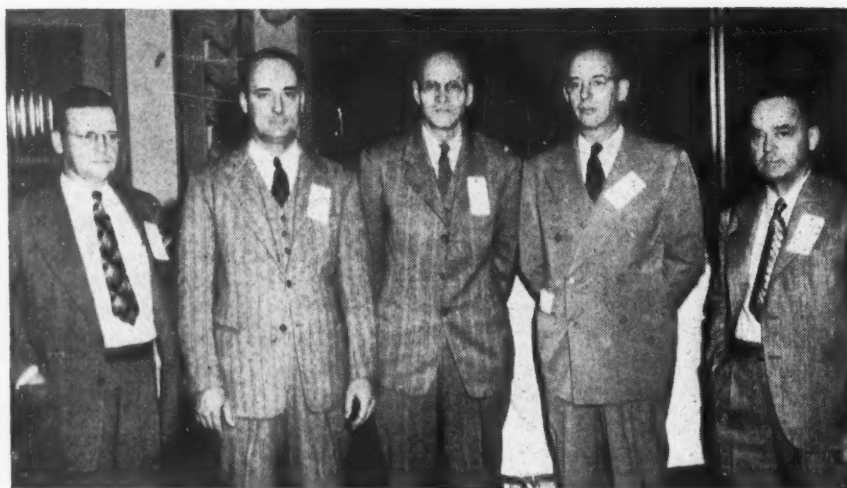
INDUSTRIAL DIVISION • WILMERDING, PENNSYLVANIA



Dr. L. C. McCabe (left), chief, coal division, U. S. Bureau of Mines, and Charles Lammers, fuel agent, C. & E. I. R.R. Co., who introduced Dr. McCabe as the speaker at the banquet.



H. M. Faust (left), New York Coal Co., James D. Reilly, vice president in charge of operations, Hanna Coal Co., and Byron Bird, Jeffrey Mfg. Co.



M. A. Matthews (left), president, Indiana Coal Preparation and Utilization Society, R. M. Dickey, Bucyrus-Erie Co., William A. Mueller, chairman, Ohio Valley Section, A.I.M.E., Morris Cunningham, Goodman Mfg. Co., and C. C. Lydick, secretary-treasurer of the Indiana society.

Deep and Strip Methods, Preparation Discussed at Indiana Coal Conference

EUROPEAN COAL MINES probably will not produce a normal output for four or five years, Dr. L. C. McCabe, chief of the coal division of the U. S. Bureau of Mines told 200 leaders of the coal industry at the banquet of the Annual Indiana Coal Conference, held in the Deming Hotel, Terre Haute, Ind., Sept. 26.

The day-long technical sessions preceding the banquet, jointly sponsored by the Indiana Coal Preparation and Utilization Society and the Ohio Valley Section, A.I.M.E., included papers on operation with power duckbills, trends in deep bituminous strip mining, developments in converting the Baum jig into a heavy-media process, preparation of high-reject coal and advantages from a utilization viewpoint of the con-

sistent preparation of medium-quality coal.

On the European Continent, the major problems of the industry, Dr. McCabe said, are lack of food, shortage of machinery and inadequate transportation. Belgian mines, the only mines not nationalized, now produce approximately 85 percent of normal output; the Saar area 75 percent; The Netherlands, 60 percent and the Ruhr Valley, 50 percent. While France is producing 105 percent of normal, the manpower used in this production is 145 percent of that used in 1938. The political agitation of the Communist Coal Union was an added difficulty to the operation of the mines during the close of the war and still is proving a hurdle, he pointed out. Dr. McCabe was a Colonel with

SHAEF in Europe during the war and last spring attended the Geneva Conference on international labor relations and labor problems in the mines throughout the world.

The first paper presented at the technical sessions, "Trackless Mining and Shaker-Conveyor Loading with Power Duckbills," by Lou Ahlen and Morris Cunningham, Goodman Mfg. Co., described how the power duckbill transforms the shaker conveyor into a loading machine with a rear conveyor as long as the room is deep. The power duckbill consists of the following pieces: a duckbill, which has been in use for several years; a swivel trough, which will swing laterally through 90 deg. and yet maintain full motion of the conveyor; and a hoist for swinging the duckbill across the face and pulling it forward to the next cut.

Two models of power duckbills are available: the 277 which is 31 in. high and the new 477, or low-vein model, reduced to an over-all height of 21 in. with only a 13-in.-high pan line. The low-vein model was developed for use in the eastern coal fields, particularly the Appalachian, said Mr. Cunningham. Rapid depletion of the higher seams of quality coal, becoming more apparent in the past war years, has focused attention on the development of high-quality seams, 48 in. and under. Referring to a recent survey made by engineers for one of the largest coal-bearing railroads in the East, Mr. Cunningham said the report reveals that the average seam thickness of all coal reserves in the territory served by this system in three states average less than 48 in. Coal operators served by this system, originally mining 5- to 7-ft. coal, are either working or contemplate working measures 3 ft. or under.

There is a definite point where labor efficiency falls off at an alarming rate in restricted working heights, said Mr. Cunningham. Considering a 4-ft. seam as par, a reduction of 1 ft., or 25 percent of the height, results in a

WHEN OTHER MACHINES ARE "MOVING UP"

MUCH time ordinarily spent on moving about is converted into productive digging time when you put a Bucyrus-Erie walking dragline on your operations. The reason is simply that a Bucyrus-Erie cuts moving time by taking the most direct route. It can walk safely and surely in any direction, can change course by a mere swing of the revolving frame; no special steering mechanism is used—or needed. The machine is always ready to step off in any direction necessitated by working conditions—away from slides, along the edge of a steep bank, around obstructions, out of trouble's way.

With its exclusive rolling-cam walking traction, a Bucyrus-Erie takes every step safely, smoothly, quickly, cushioning the machine down. Rough ground seldom bothers because the walking shoes are mounted to pivot sidewise, conforming to any ground surface for a firm grip.

The walking efficiency of a Bucyrus-Erie gives you more time to use its "years ahead" digging efficiency!

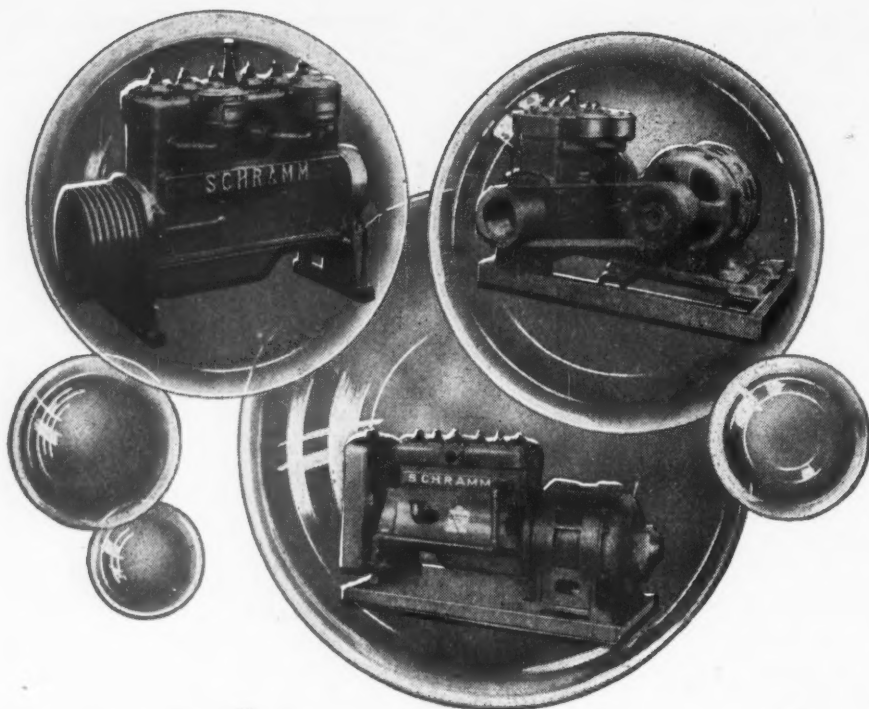
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Bucyrus Walkers
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Booms: 110 to 250 ft.
Buckets: 4 cu. yd. to 25 cu. yd.

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is more than a pipe dream. SCHRAMM COMPRESSORS, for example, package air every day for industrial consumption. The selection of SCHRAMM AIR COMPRESSORS is influenced by features that include: (1) 100% water cooled; (2) forced feed lubrication; (3) mechanical intake valve; (4) compact, lightweight. Designed for heavy duty, continuous service and minimum attention. There's a SCHRAMM AIR COMPRESSOR for your every need, in sizes ranging from 2 to 600 cubic feet displacement.

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production decrease of 40 percent. A reduction of $1\frac{1}{2}$ ft., or $37\frac{1}{2}$ percent of the working height, results in a production drop of 60 percent. Because of this situation, the greatest demand for cost reduction has so far channeled the major applications of the power duckbill in the East into seam heights under 48 in.

The value of power duckbill operation is best realized when an overlapping cycle of cutting, drilling and loading is maintained.

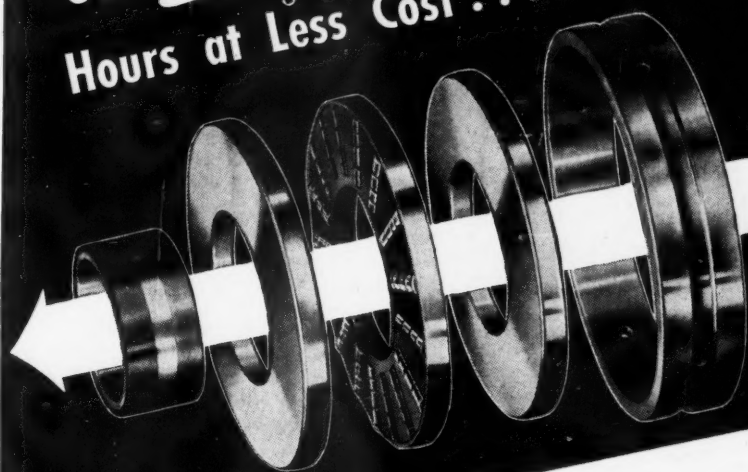
The same general obstacles are encountered in trying to remove 25 ft. of overburden as are present when removing 90 ft., said R. M. Dickey of Bucyrus-Erie Co., in his paper, "Modern Trends in Deep Bituminous Coal Stripping." In discussing pit conditions, Mr. Dickey stated that an unstable highwall must be worked so as to give it maximum stability and that unstable spoils developed from free dumping must be reworked to impart maximum stability.

In deep stripping, the haulage berm exerts a much greater effect on overall costs than in shallow stripping. When the berm is used the spoil must be moved extra distance on each cycle of the excavator. Building additional range into the machine to transport material over the berm increases its size and cost materially. There are very few pits, declared Mr. Dickey, that cannot be operated without a haulage berm, either by double-ended pits with coal loading retreating toward each end from the center, or by a central haulage road through the spoil piles and loading from each end toward the center. In either case the entire width of the cut is loaded out. Hence, it could well be axiomatic that in deep stripping the berm must be eliminated unless proven to be essential.

The appraisal of the economic merits of different types of equipment for deep stripping should be based on cost per ton of coal through the tippie for the fiscal year rather than by the direct cost of stripping each cubic yard of overburden, said Mr. Dickey. The use of progressively larger stripping shovels may lead to certain operating difficulties since greater range and larger dippers increase the size and weight of the machines. Wider pits would be required, maintenance costs would be more; and bearing pressures would be increased. Another consideration affecting shovel operation in deep stripping is that the shovel works most effectively and at lowest cost at or below the height of its dipper shaft. Above this elevation the hoist and crowd are usually opposed, which results in higher maintenance costs for the machine.

The large crawler-mounted draglines usually operate from the coal surface along with shovels, benching the upper part of the overburden ahead of the shovel. While the dragline in this instance requires less range than if it were operating from

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Hours at Less Cost . . .



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Right-Angle-Loaded
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Right-angle loading actually means fewer shut-downs...lower maintenance costs...longer hours of machine operation with fewer bearing replacements. These features prove it:—

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2. Right-angle loading prevents wedging of rollers and pinch-out. Greatly reduces roller end-rub . . . wear-back and rubbing friction.
3. Permits greater radial or thrust load-carrying capacity in any given dimension.
4. Assures solid cylindrical rollers of greater roller mass and uniform roller cross-section.
5. Assures greater resistance to shock loads and vibration . . . longer life expectancy under continuous heavy-duty service.

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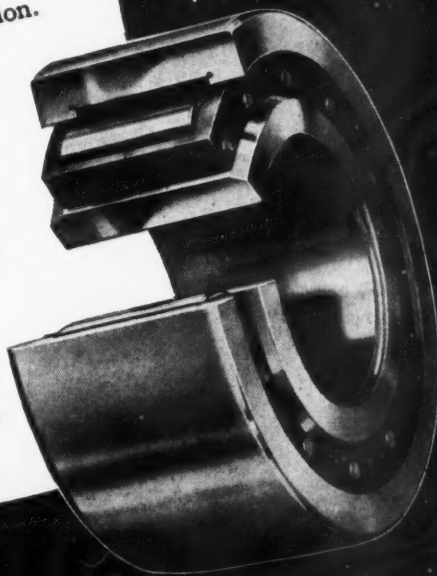
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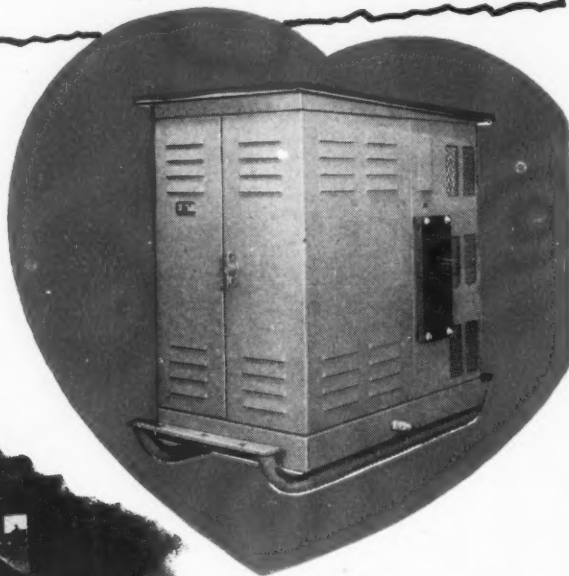
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A roof fall . . . a flash of flame . . . a trolley wire down! What happens next? Fire? Explosion? And what about your production? Do all your operating sections suffer, while trouble in just one section is cleared?

If a mine electrical distribution system is properly sectionalized with I-T-E Type KSC Automatic Reclosing Circuit Breakers, trouble in one section cannot stop service in others. Production levels are raised: time lost because of electrical disturbances is kept to a minimum, and safety to personnel and equipment is assured.

A rugged, completely dependable breaker, the KSC was developed especially for the mining industry. It is compact in construction and flexible in operation; it can be readily moved as mining progresses and centers of loads change. It is completely metal enclosed for safety and for prevention of unauthorized adjustments, yet is readily accessible for inspections and maintenance.

The KSC operates on circuits which can be fed in either direction, and it opens at first sign of short or overload—reclosing automatically on a return to normal line conditions. Voltages can be safely improved throughout the system by tying all feeders and trolleys into one network. Sections help one another by raising the diversity factor for the entire system, yet—with the KSC installed—shorts cannot be fed by distant substations, and substations are quickly separated when disturbances occur.

• Increased production is just one of the many advantages to be gained by sectionalizing your electrical distribution system. The I-T-E representative in your locality will be glad to tell you of others, and to advise you on the proper applications of I-T-E Type KSC Automatic Reclosing Circuit Breakers to your mine. Use his service with no obligation.

Be Production-wise . . .
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the highwall, it is less efficient because it is digging well above its base rather than below it. Large walking-type draglines have been used with shovels, benching the upper part of the overburden ahead of the shovels. Walking draglines also have been used in pairs, both machines operating from a bench; one removing the upper part of the overburden and the other the lower.

Within two years an operation in Southern Indiana will use a dragline and a shovel to handle deep overburden. The overburden being firm, both machines will operate from the same bench. However, the shovel will be in front and will remove the upper part of the overburden ahead of the dragline. This method has recently been employed with success on a smaller scale in Southern Illinois. Here a relatively thin seam was stripped by a shovel on the coal and a dragline on the highwall, both crawler-mounted. However, to eliminate the crushing of the coal by the shovel crawlers, both machines were shifted to a limestone bench 10 ft. above the coal. The shovel removed the material above this bench and the dragline handled the remainder of the overburden. This method also holds promise for stripping two seams separated by a suitable vertical interval.

Many strippers share the belief that the basic solution to handling deep overburden is to have walking draglines, 7 cu.yd. and smaller, located on the spoil pulling back the material dumped by the shovel. They contend that if the excavation is handled by a high-capacity, relatively short-range unit, either shovel or dragline, working with a walking dragline of suitable capacity located on the spoil and acting as a transportation unit, the combination will have both high output and excellent transportation ability. Moreover, the dragline located on the spoil could minimize the danger of slides by giving the spoil a flatter slope than could be obtained by free dumping from shovel or dragline.

A second wheel excavator is expected to be placed in service in the near future. A wheel excavator is a large crawler-mounted unit that operates from the coal surface with a stripping shovel and takes the upper overburden ahead of the shovel. As now constructed, the wheel excavator is restricted to tandem operation with another excavator and operates most successfully in the softer types of overburden. Its vertical range is limited by the vertical arc through which the wheel can be raised or lowered, and its horizontal range by the dimensions of the conveyor system. In general, its use is linked to stable conditions in both highwall and spoil pile.

The tower excavator, said Mr. Dickey, is a self-propelling slack-line scraper and was first developed for levee building. The newer machines have an electrically-powered head tower and a gasoline-engine-driven

MINE EQUIPMENT

7 Reasons

1. Saves lost motion
2. Avoids complication
3. Is strong enough not to break down under hardest service
4. Safeguards men and equipment
5. Prevents degradation or waste of product
6. Uses less power than other or similar equipment
7. Keeps down "overhead" by low initial cost and reducing depreciation of plant

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tail tower, the propelling and steering of either tower being handled independently. They are equipped with crawler mountings and handle up to 13 cu.yd. with a scraper-type bucket, with the towers spaced 700 to 800 ft. apart. The machine was applied to coal stripping in a North Dakota lignite operation about five years ago. The head tower is located on the spoil piles and the tail tower on the high-wall, the machine spanning the pit. A scraper bucket removes the upper part of the overburden, in this instance reaching 70 ft. thick, ahead of the stripping shovel and drags it to the spoil, usually making a bench some five shovel-cuts wide.

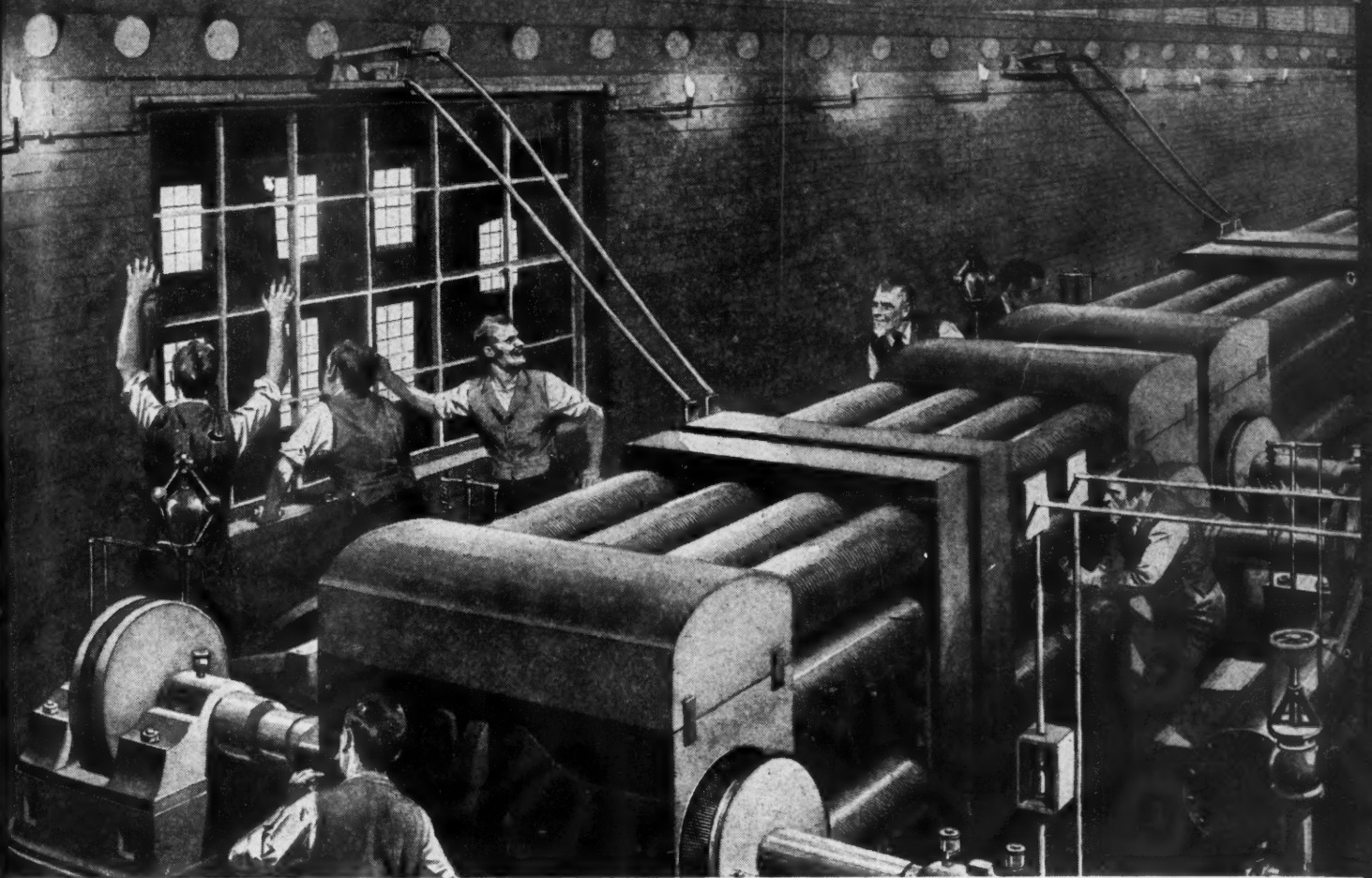
Within the next few months it is proposed to install a tower excavator at a strip mine in Central Illinois. At this property a sloughing highwall has proven troublesome. Here, it is thought that the tower excavator will not only reduce the overburden to a depth suitable for the stripping shovel, but also will, by removing the upper part of the burden, minimize highwall slides. It should further be capable of flattening the slopes to the spoil piles, thus lessening the likelihood of spoil slides into the pit. In summarizing, Mr. Dickey said, the machinery trend in deep stripping seems to be in the direction of combinations of units, with resulting operating flexibility, rather than toward even-larger single units.

The best answer to washing coal appears to lie in the commonest of all types of washers, the Baum jig, declared Byron Bird, Jeffrey Mfg. Co., in a paper entitled, "Recent Developments Convert the Baum Jig into a Heavy-Medium Process." Why add sand, magnetite or some other material to a coal to form a heavy medium, he asked, when a natural medium-forming material of fundamentally better characteristics is to be found in every coal?

Jigging, Mr. Bird said, is inherently a "heavy-medium" process. For instance, an Alabama jig, operated to make a separation at 1.60 specific gravity, showed a medium density of 1.53, measured just above the opening leading to the refuse elevator. The bed density so measured was the average of the solids and the water considered as a medium. It was a true medium, with every particle helping to building medium for every other particle. However, it was .07 specific gravity below the actual gravity of the separation being affected.

Since that time one or two instances have been found where the medium density of the natural jig bed was just right or very close to it. But such cases are unusual. Typically, a jig feed is deficient in particles of the right size and density to form a medium of high enough specific gravity. But the fact that the natural jig bed is so close to the desired specific gravity makes building it up artificially very attractive. Evidently, the amount of medium to

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be added would be very small. A suitable medium has now been found, one that in all essential particulars changes the Baum-type jig into a float-and-sink machine capable of washing any size range simultaneously from 8 in. to 200 mesh.

The development of a "back-stroke" separation, which preceded the development of the heavy-medium process, is a necessary part of removing the heavy medium from the washed coal. It meant development of the jiggling process itself, for, obviously, if a conventional type of jig stroke is used, one in which a considerable part of the separation takes place on the up stroke, the high specific-gravity material necessary to form a suitable medium will be thrown over into the washed coal. In 1937, while tuning up a new jig installation, Mr. Bird happened to hit on an air valve setting in which the size and shape of particle seemed to make no difference. Refuse 48 mesh in size began appearing in the refuse elevators along with 6 in. pieces.

With that start, back-stroke jiggling has been making steady progress over the last 10 years.

Some of the fundamentals of the down stroke are:

1. **Rapid acceleration.** The upward acceleration of the water must be rapid to lift the bed in mass.

2. **Intermediate sizes required.** The screen analyses of the jig feed must be such that the bed can be lifted in mass. To be lifted, the particles must lock together. This involves sufficient intermediate sizes.

3. **Low water.** The "net" upward water must be a minimum. The rapidity of the down currents is determined by the difference in level between the water in the jig bed and that in the air chamber. The "net" upward current water is the water added through the jig header and is the water added to replace what does not come back through the screen on the return stroke. Inasmuch as the down stroke should be as rapid as possible, it follows that in an ideal jiggling operation, the net water or added water should be zero. Enough water should be introduced with the feed to transport the coal along the jig and no other water should be needed. The average jig operator, said Mr. Bird, uses too much water. Actually, there is no surer way to throw off the cleaning on the small sizes than to use water indiscriminately.

4. **Long expansion periods.** The period during which the air is allowed to expand is of great importance in getting the bed adequately opened so that all of the water can return to the hutch compartment on the return stroke. A typical jig stroke today is 100 to 120 deg. air admission; 100 to 80 deg. expansion; and 160 deg. exhaust. The long expansion has been very beneficial in getting a perfect opening of the jig bed on the up stroke. Long expansion also means

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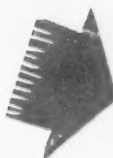
Choose the new MineVent Vinyl Plastic Coated Tubing for greater mine safety, easier handling and maximum overall economy. Under actual test you will find it outlasts tubing of other materials.



Because it is lighter in weight per foot than ordinary ventilation tubing this new Vinyl Plastic Coated MineVent Tubing costs less to ship, is easier to handle and install.

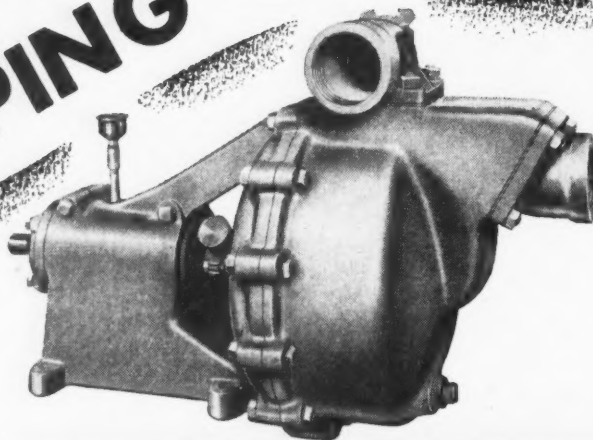
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Send for this Bulletin, No. 107. Gives complete data on this Vinyl Plastic Coated material and tells of the months of development and testing that went into this "last word" in flexible mine ventilation tubing.



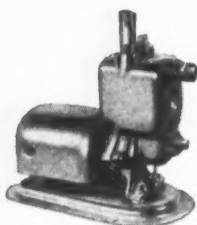
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Gorman-Rupp self-priming centrifugal pumps have been specially engineered from every standpoint to meet specific mining requirements.

MINE GATHERING - These husky mine gathering pumps pump 24 hours per day, continuous operation, for long periods of time without attention. They are guaranteed to self-prime at a maximum static suction lift of 25 feet. Because of the air handling ability of Gorman-Rupp pumps a positive suction is maintained and by actual test will prime in less than three and one half minutes with one hundred feet of 2" suction line.

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very slow jig speed, around 22 strokes per minute. This gives ample time for complete opening of the jig bed to the very topmost layers on every stroke.

5. Shallow jig bed. The depth of the jig bed, from the screen plate to the overflow lip, should be a minimum. Too deep a bed acts as a valve interfering with the return of water through the screen plate. Tests show that in handling an 8x10-in. feed, the jig can be operated successfully with a bed as shallow as 22 in.

6. Clean circulating water. Clean water facilitates the return of the water through the screen plate. The jig action is distinctly dampened if the water gets above 25-percent solids (1.08 specific gravity). In this connection, the argument has often been advanced for running a jig with dirty water, that its higher specific gravity is an advantage. A moment's consideration will show that a specific gravity as low as 1.08 really could not enhance the jig operation in any significant way. Experience shows that the cleaner the circulating water is, the better the jiggling.

The foregoing discussion, said Mr. Bird, has been necessary to show a workable scheme for using a heavy medium without washing it over with the coal. Necessarily, the medium of high specific gravity must go out with the refuse or the middling product so that it can be recovered and returned to the jig feed. The pure backstroke separation takes care of this problem, said Mr. Bird.

Jigging on unsized materials is inherently a perfect gravity process, the only one thus far discovered, but it is subject to severe limitations as to capacity. The medium speeds up the separation. Mr. Bird showed how the ratios of specific gravities of two particles of bone, one of 1.50 specific gravity and the other of 1.45 specific gravity, govern the rapidity of their separation. With different media they varied from slightly above 1.0 to infinity as the density was increased. The gain was most rapid as the medium approached the specific gravity of the separation, 1.45.

The gains in relative specific gravity are tremendous, but they cannot be realized fully in speeding up the separation because as the density of the medium increases, the particles settle more slowly. However, the relative gain is very great, as shown by greatly improved cleaning of the fine sizes with an artificial heavy medium present.

A bone, prepared by crushing, sizing and blending the product of the last refuse elevator, of about 2.00-percent specific gravity makes a medium of about the right density. For instance, bone of about 1.9 specific gravity is suitable for a medium of 1.50 specific gravity and bone of about 1.8 specific gravity for a medium of 1.45 specific gravity. The amount of medium required varies according to how much bone of the right specific

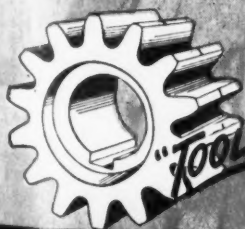
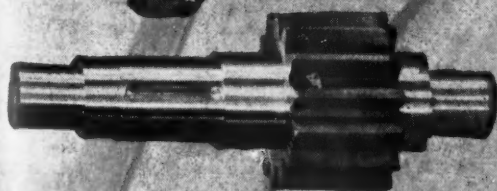
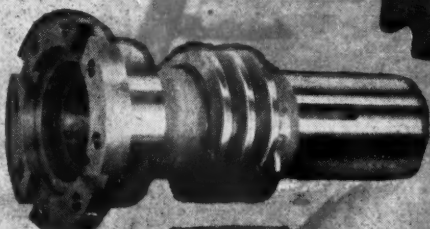
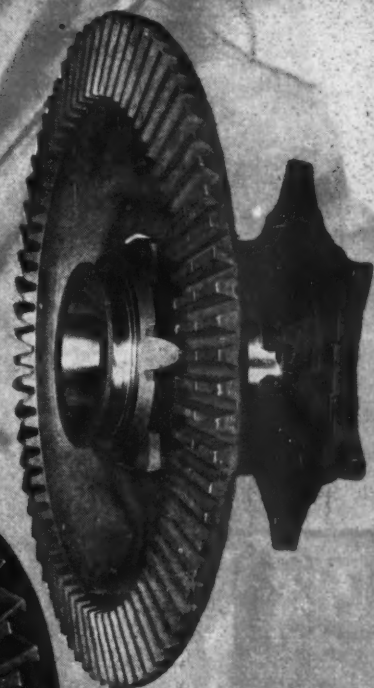


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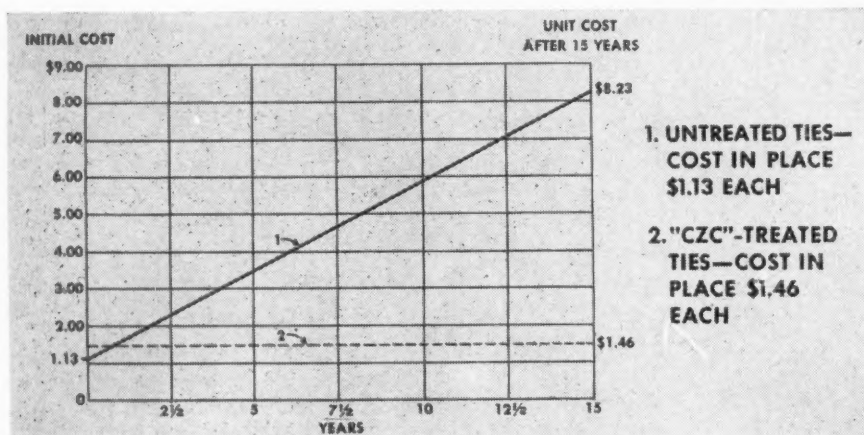
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The Chart Above shows why it pays to use "CZC"-treated ties and timbers. Figure it out:

Assume an initial cost of 89¢ each for "CZC"-treated ties, and the initial cost of an untreated tie at 56¢. Total cost of installing an untreated tie—including delivery underground (estimated at 6¢) and labor cost for placing and spiking (at 51¢)—is \$1.13. Using these same figures, the cost of installing a "CZC"-treated tie is \$1.46.

Cost of Renewal High

The estimated life expectancy of an untreated tie is 2½ years, and the minimum life of a "CZC"-treated

tie is 15 years. Therefore, the original untreated tie plus five renewals may be required to give the same life as a treated tie. The cost of laying a renewal tie, including spiking, removal and disposal of old ties, is estimated at 80¢ each.

Over a 15-year period, the cost of using untreated ties is \$8.23 per unit, compared with \$1.46 per unit for "CZC"-treated ties. The saving is even bigger if interest charges are applied on the investment.

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gravity and size occurs in the jig feed.

Some observations on the artificial mediums outlined by Mr. Bird were:

1. The jig medium appears to act over the entire size range of coal. The cleaning of the 48x100 mesh is greatly improved by its use.

2. All sizes of coal tend to be washed at one specific gravity, which means that a falling medium has no sizing action. It gives this medium an important technical advantage over those whose specific gravity rises, for they have a sizing action that limits the size range effectively cleaned.

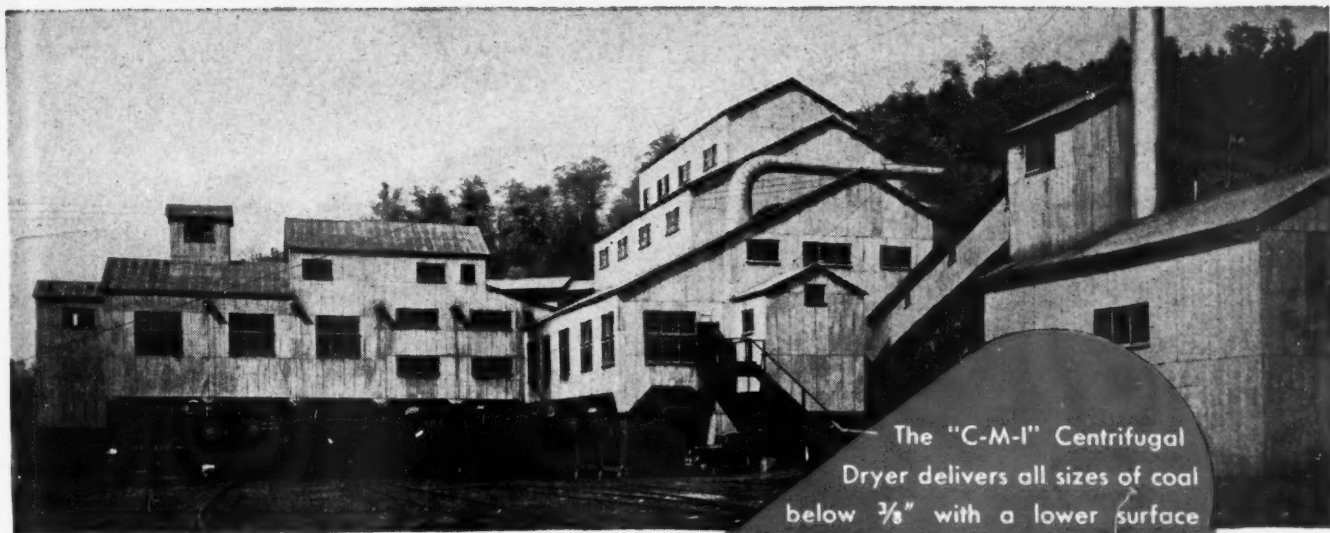
If a coarse egg size must be washed at a lower gravity than the smaller sizes, the back stroke must be modified by the addition of some water to hold down the medium density. However, many companies, because of the growing importance of the domestic-stoker market, wish to clean all sizes at a relatively low specific gravity.

3. The crushing circuit looms important in liberating coal from laminated pieces so it can be recovered.

4. Seemingly, any difficulty of separation can be handled.

Considering our practice of run-of-seam loading (14 tons of run-of-seam material per man on the payroll, 38 percent of which is rejected at the preparation plant) it is apparent that a very efficient washing job is required, said James D. Reilly, vice president in charge of operations, Hanna Coal Co., in his paper, "The Preparation of High-Reject Coal for Discriminating Markets By Use of Jigs, Tabling Plants, Heat and Centrifugal Dryers." To meet competition in the fine sizes, it was necessary to produce a 7.5-percent-ash slack coal at 13,000 B.t.u. The raw slack contains 18 to 20 percent ash and only 11,200 B.t.u. Competitive mines in the Pittsburgh area were mining raw slack with 12-percent ash and 13,200 B.t.u. This coal, when washed to an 8-percent ash, was increased to 14,000 B.t.u. Northern West Virginia mines were able to ship a ¾x0-in. raw slack to power plants at 8.4-percent ash and 14,000 B.t.u. on an "as-received" basis.

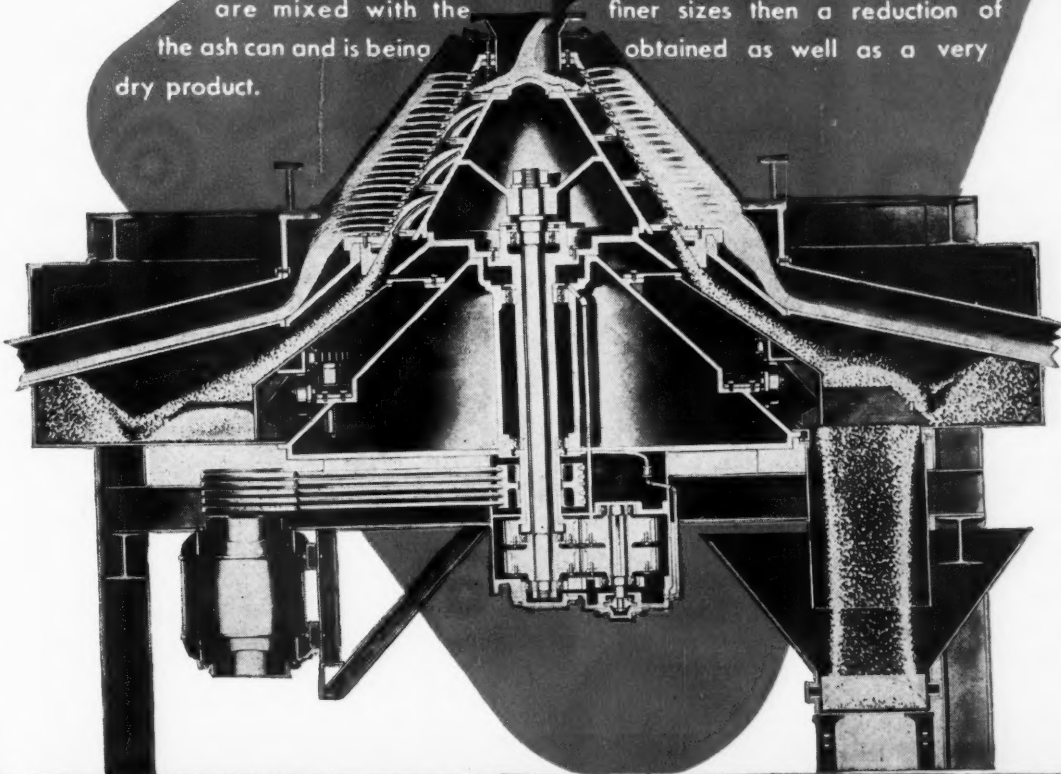
In washing the slack, or ¾x0 in., in jigs to the required 7.5-percent ash, the washing efficiency on the 3/16x0-in. was extremely poor, causing a considerable loss of coal in the refuse, Mr. Reilly said. To improve this efficiency and still maintain this low ash requirement, Deister concentrating tables were installed for washing the 3/16x0-in. At present, the washing set-up is to hand pick the plus 7 in., wash the 7x1¼ in. in one Link-Belt jig, the 1¼x3/16 in. in another Link-Belt jig, and the 3/16x0 in. on the Deister tables. Sixty-five tons per hour of raw 3/16x0 in. is wet-screened ahead of these tables and settled in a drag-type settling tank, from which it is carried to a 30-ton surge bin. The coal is fed from this bin to a distributor of Deister design



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Dryer delivers all sizes of coal
below $\frac{3}{8}$ " with a lower surface
moisture content than can be obtained
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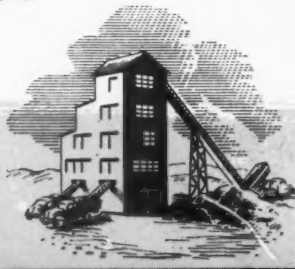
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Continuous
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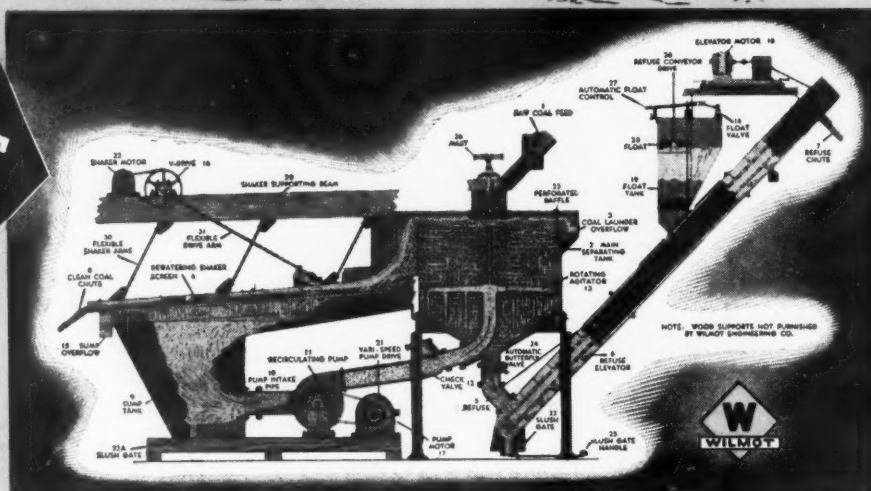
FULLY AUTOMATIC—One man can tend three or more Hydrotators.

QUALITY CONTROL—Desired gravity of medium for best preparation is accurately maintained.

HIGHER YIELD—Efficiency assures complete recovery of good coal. Automatic prevention of loss in refuse.

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COMPLETE OPERATING UNIT—An individual unit performs entire cleaning process for each of these sizes: Pea, Buck No. 1, Rice, Barley, No. 4 and No. 5.



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At last—a fully automatic coal cleaner for operators of small anthracite and bituminous mines, silt and refuse banks, and rivermen. With this new small Wilmot Hydrotator you can enjoy the fast, efficient preparation of a big breaker. Feed capacity of 10 to 25 tons per hour; simple in design and easily maintained. Let us send you further details of how this new unit cuts cleaning costs.

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Wilmot Coal Preparation Equipment: Hydrotators • Hydrotator-Classifiers • Hydro-Separators • Simplex Jigs
Crushing Rolls • Sizing Shakers • Bucket Elevators • Conveyors • Car Hauls • Keystone Rivetless Chain, etc.

WILMOT BUILDS BETTER BREAKERS

and distributed to eight tables. The ninth table is kept as a spare.

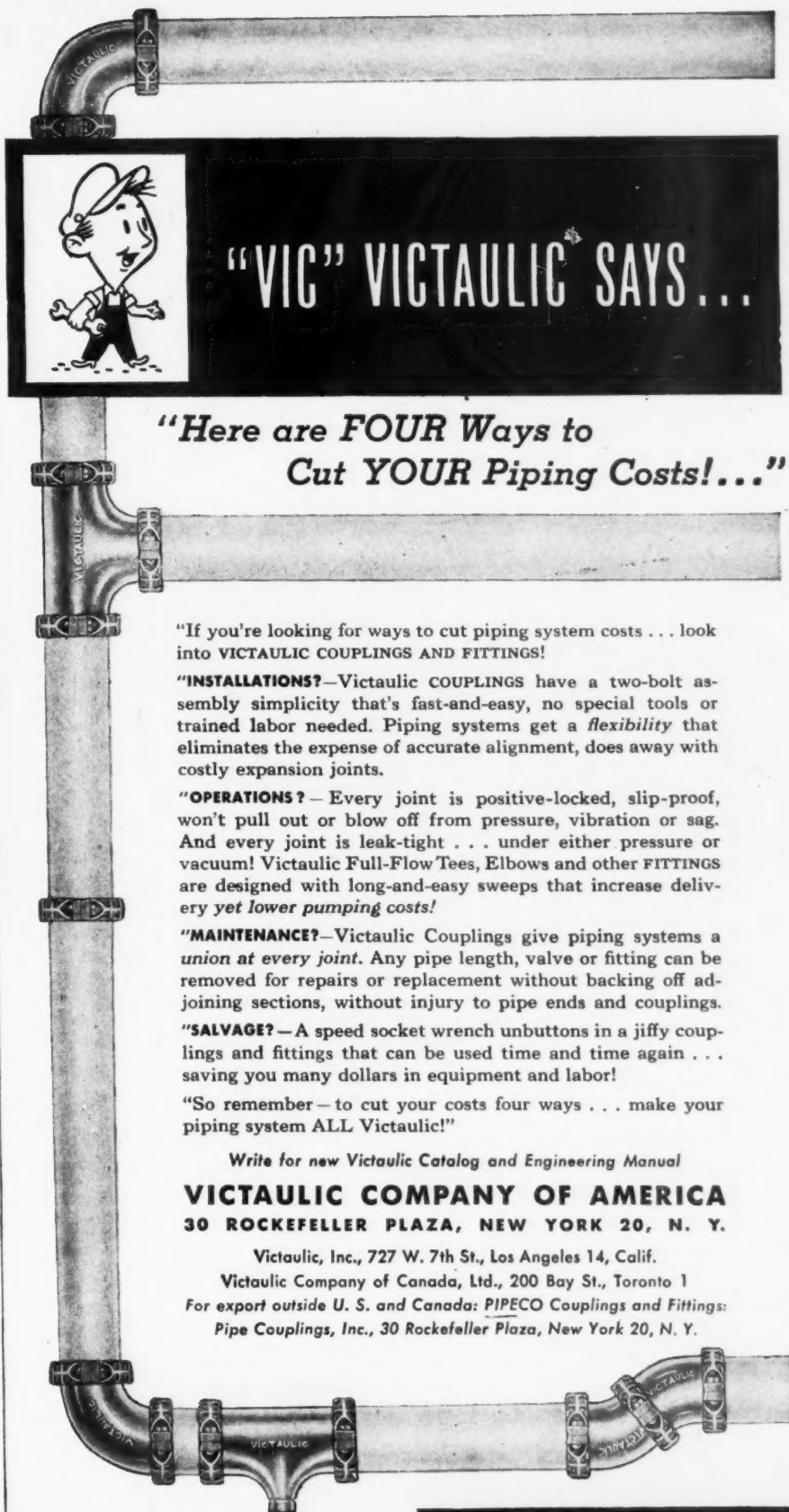
A Vortrap, a device designed to classify and separate materials in liquid suspension by means of centrifugal force, is used to recover the fine solids that ordinarily pass out the overflow of the settling tank. The Vortrap is in a sense a water cyclone where "dust" is separated from water, rather than air. It consists of an 8-in.-diameter rubber-lined pipe about 10 ft. long with a specially designed head piece wherein the water-solid solution is pumped in tangentially. The swirling and centrifugal action gradually forces the solid particles to the outer edge where they settle to the bottom and pass through a rubber diaphragm, or orifice, and out the discharge.

This diaphragm also imparts an upward motion to the clarified water in the center of the pipe, which continues upward and passes out the center hole in the head piece. One Vortrap 8 in. in diameter will handle water to be clarified at 800 g.p.m., containing 8 to 18 percent solids, producing a thickened discharge at 50-percent solids, amounting to 4 tons of solids per hour on a dry basis. It is planned to return the thickened discharge from the Vortrap to the table feed and re-use the effluent in whole or in part in the plant's water recirculation system.

Washing the slack to the required 7.5-percent ash left the coal with a moisture content of 8 percent. While washing beneficiated the product by 12.5 to 13 percent in ash, it added the equivalent of 5 percent in moisture (on the basis that 1 percent of moisture is equal to 1 percent of ash when considering B.t.u. value), leaving a net gain in ash content of only 8 percent, or a 12-percent ash product. To produce a slack containing only 7.5-percent ash and at least 13,000 B.t.u. the fine sizes had to be dried.

Before the 3/16x0-in. fines from the settling or dewatering tank could be thermally dried, they had to be passed through centrifuges. These units reduced the surface moisture of the fines from 30 to 7.5 percent.

The flash dryer used consists of a stoker-fired combustion furnace, a 30-in.-diameter 30-ft.-long vertical stainless-steel drying stack, a 12-ft.-diameter cyclone collector lined with 2 in. of Gunite, and a suction fan capable of handling 30,000 cu.ft. of gases per minute. Wet feed, 3/16x0-in. coal centrifugally dried, is fed from a surge bin through a variable-speed screw conveyor into the bottom of the drying stack. The coal particles are immediately swept upward by the combustion gases from the furnace and carried into the cyclone. There the dried coal particles are collected and dropped through a rotary air lock onto a conveyor where they are conveyed back to the main plant and combined with the 3/4x3/16-in. coal already washed and dried by other methods. The moisture and gases from the cyclone pass through a



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"MAINTENANCE?"—Victaulic Couplings give piping systems a *union at every joint*. Any pipe length, valve or fitting can be removed for repairs or replacement without backing off adjoining sections, without injury to pipe ends and couplings.

"SALVAGE?"—A speed socket wrench unbuttons in a jiffy couplings and fittings that can be used time and time again... saving you many dollars in equipment and labor!

"So remember—to cut your costs four ways... make your piping system ALL Victaulic!"

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for Real Modernization

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BIG FIST

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Coal Shovels




SPEED Production

BIG FIST COAL SHOVELS speed production because their generous size and fine precision balance enable the miner to shovel more coal with less effort.

A FINE QUALITY PRODUCT OF



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The Wood Shovel and Tool Company, Piqua, Ohio

straight-bladed fan and escape to the atmosphere. At present, the dryer is drying 50 tons of 3/16x0-in. coal per hour, the final product containing 2.0 to 3.0-percent surface moisture. This moisture figure could be lowered below 1 percent by adding a secondary dust collector after the cyclone.

Consistent preparation is an important factor in the utilization of high-, medium- and low-grade coals, said H. M. Faust, research engineer, New York Coal Sales Co., Columbus, Ohio, in his paper, "The Advantages of Consistent Preparation of Medium Quality Coals from a Utilization Viewpoint." The advantages of consistent preparation from the utilization viewpoint, he said, can be divided into three general groups:

1. **Physical qualities, including sizing and structure.** Uniformity of top size is important with certain types of mechanical feeding, especially for pulverized fuel and pneumatic spread stokers. Oversize coal may tear up coal handling equipment such as conveyors and elevators. The percentage of various sizes making up the consist of shipments is important since a change in size almost always changes the weight per cubic foot. Since the rate of feeding coal with most mechanical firing equipment, and inherently with hand firing, is based on volumetric displacement, the effect of variation in the size percentages is very critical. An increase in the percentage of fines offers greater resistance to the passage of air through the fuel bed and increases the coking and caking characteristics of the coal. Flyash becomes more serious as the percentage of fines increases.

2. **Burning qualities.** With the highly concentrated loadings of mechanical mining, and also with certain selective mining operations, the coal loaded for shipment may carry an inconsistent percentage of certain bands or strata from the seam, such as bone, cannel, etc., which would change the free swelling index, grindability, ash-fusion, or other characteristics. Any one or a combination of these could wreak havoc with the uniform operation of a boiler plant.

3. **Analytical qualities.** Moisture, ash, sulphur, heating value and ash-fusion temperatures of a coal are termed its analytical qualities. Shipments of coal containing consistent heating value and ash-fusion temperatures require uniform moisture, ash and sulphur content. Moisture content running on the high side results in mechanical-handling difficulties, climaxed, of course, when in conjunction with an extraordinary amount of fireclay or freezing during cold weather. Pulverized-fuel grinding capacities are usually adversely affected by increased moisture content. Chain-grate installations, on the other hand, frequently suffer combustion-wise when the coal is abnormally dry. Mr. Faust listed the advantages

10 Years Service in 3 Mines



ANOTHER TRANSITE PIPE RECORD in acid mine water service

THE TRANSITE PIPE drainage line pictured above has seen rugged service in 3 mines of the Kelley's Creek Colliery Company. Yet today, *after more than 10 years of exposure to the action of corrosive mine drainage waters*, it is still on the job at the company's Maiden Mine, Maidsville, W. Va.

Such performance is not exceptional for Transite. The high corrosion-resistance of this asbesto-cement pipe has enabled many producers to figure the life of their drainage lines in terms of years—instead of months. Furthermore, this long life may be utilized in different locations as the need arises . . . for Transite can be easily and effectively relocated.

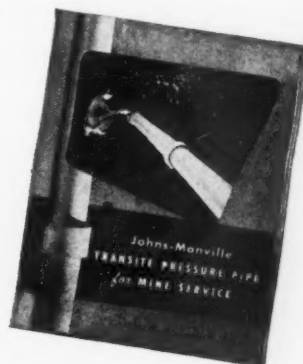
FOR ALL TYPES OF MINE SERVICE

Draining acid mine waters is only one of many ways Transite saves money for coal operators. For water supply lines, Transite offers the advantage of an unusually high carrying capacity—helps assure

low pumping costs. For fire prevention ducts . . . for spray and return lines from condenser cooling towers and for many other services where a tough, durable, easily installed pipe is required, Transite provides important economies.

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A new brochure "Transite Pressure Pipe for Mine Service" gives full details about this versatile asbesto-cement pipe . . . tells how Transite can help you eliminate frequent replacements and reduce your pipe line maintenance. Write Johns-Manville, Box 290, New York 16, N. Y. for your free copy of this new brochure.



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The LUBRIPLATE Tag Service assures the machinery manufacturer, who uses LUBRIPLATE for initial lubrication, that the machines will be serviced with the same outstanding lubricant. Machine Builders, use the Tag Plan. Machine users, mail the post cards you find on the equipment.

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No. 2 — Ideal for general oil type lubrication, ring oiled bearings, wick feeds, sight feeds and bottle oilers.

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BALL BEARING — This is the LUBRIPLATE Lubricant that has achieved wide acclaim for use in the general run of ball and roller bearings operating at speeds to 5000 RPM and temperatures up to 300 degrees F.



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accruing to the boiler plant assured of a coal with consistent preparation, as follows:

1. No need to adjust combustion equipment to suit varying fuel requirements. Less labor, lower labor costs, more satisfied and cooperative personnel, and lower combustion-control equipment costs are a direct result.

2. Maximum capacity from units in

service—less plant overhead.

3. Less combustion-equipment outage—greater plant capacity—lower maintenance cost.

4. More uniform operating conditions—higher efficiency and lower fuel cost.

5. Less smoke and atmospheric pollution—better public relations, and more assurance of the continued use of coal.

Need for Greater Safety Training Stressed by Coal-Mining Section

A call for concerted action on more and better training of workers, safer mining methods and equipment, in the interests of coal-mine safety, was sounded at the National Safety Congress, annual meeting of the National Safety Council, in Chicago, Oct. 6-10.

Addressing the Coal Mining Section of the Council, James H. Forgie, safety engineer, American Rolling Mill Co., Montcoal, W. Va., said that, based on conservative estimates, 5,904 coal miners in the United States would be killed and 590,400 would suffer disabling injuries during the next six years. The total, he declared, equals the number of miners, presently employed in all mines in this country.

"This menace," Mr. Forgie declared, "can and will be licked only when we believe that it can be done." He urged greater care in the training of supervisors in the problems of safety and more work by the supervisor in teaching new employees the safe way to do their job.

Looking at the coal-mine accident picture from another angle, R. G. Warncke, mining engineer, U. S. Bureau of Mines, Washington, D. C., pointed out that, despite the still doleful situation, progress in preventing accidents is being made. Many of the safety achievements in mining, he asserted are as good as those in less hazardous occupations and some are better. Individuals have worked 50 years or more in and around mines without sustaining a lost-time injury. Mines have operated from one to nearly five years without a single day being lost by any worker, due to injury. Coal-mining fatalities in 1946 were the lowest in the history of the industry, he pointed out.

Much, however, remains to be done in mine-accident prevention, Mr. Warncke said citing the fact that mining has an accident frequency rate about seven times that of some 38 major industries. In the coal-mining industry, he added, frequency rates are about 10 times that of the average for all industries, and about 2½ times as great as in non-coal mines.

"Certainly the mining industry can do as well in the future as it has done before," said Mr. Warncke. "With

equal certainty the coming years should bring safety accomplishments far exceeding those achieved in the past."

How the lives of 400 coal miners have been "saved" in Ontario during the past 10 years was related by T. W. Kierans, assistant general safety engineer, International Nickel Co. of Canada, Ltd. During this period, he said, mine accident prevention education has become an integral part of all mining operations in Ontario, resulting in a decline of the average annual frequency of fatal accidents from 2.92 per 1,000 employees to 1.48, despite the doubling of average annual employment in mining.

The major reason for this improvement, he explained, has been the fact that miners learn safety while working. Any mine accident prevention program, he insisted, should be based on on-the-job instruction, in which new employees and workers moved to new jobs learn safety rules for their work under actual mining operations.

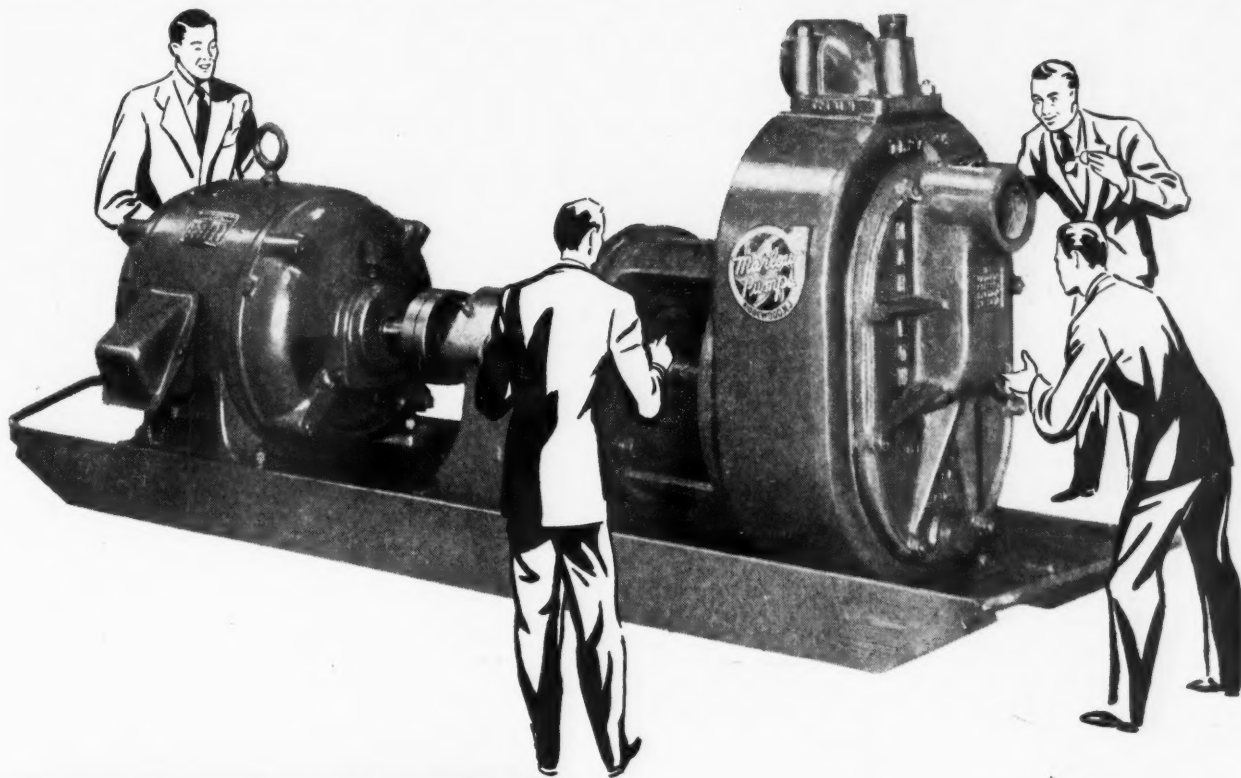
Further developing this thought, Walter H. Steen, manager of industrial relations, United States Coal & Coke Co., Gary, W. Va., pointed out that instruction of new employees in safety too often is confined to a short speech on safety by a representative of the personnel or safety department, an explanation of the company's safety program and the presentation to the employee of a book on safety rules.

"Such an approach is, without question, inadequate," declared Mr. Steen. He proposed an expanded training program, in which the foreman would give continuous and thorough instruction to new employees in all possible safety precautions needed for the successful execution of the jobs to which the worker has been assigned.

"In industry," said Mr. Steen, "we have established production control, cost control and control of almost every other phase of the operation. We must now give some thought to 'training control,' which simply means that training will be recognized by management as an integral part of the over-all production picture and will be given its rightful place in industry."

Taking a job short cut is one of

THE PUMP THAT **KEEPS** MINE DRAINAGE COST DOWN



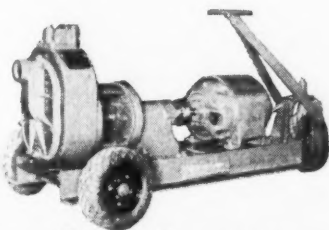
MARLOW MINE GATHERING PUMP

Marlow pumps start cutting drainage costs the first day on the job. But that's only one of the reasons you see Marlow Self-Priming Centrifugals in so many mines today.

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New Officers Coal Mining Section National Safety Council

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Pittsburgh, Pa.

First vice chairman—C. R. Stall,
Eastern Gas & Fuel Associates, Coal
Division, Mt. Hope, W. Va.

Second vice chairman—George
Roos, Philadelphia & Reading Coal
& Iron Co., Pottsville, Pa.

Secretary—H. J. Sloman, U. S.
Bureau of Mines, Pittsburgh, Pa.

the quickest ways to accidental death or injury, declared George Gedge, safety engineer, Hollinger Consolidated Gold Mines, Ltd., Timmins, Ont. An analysis of fatal mine accidents, he said, reveals that haste in doing a specific task, and thus overlooking a safety rule, is one of the major causes of mine accidents.

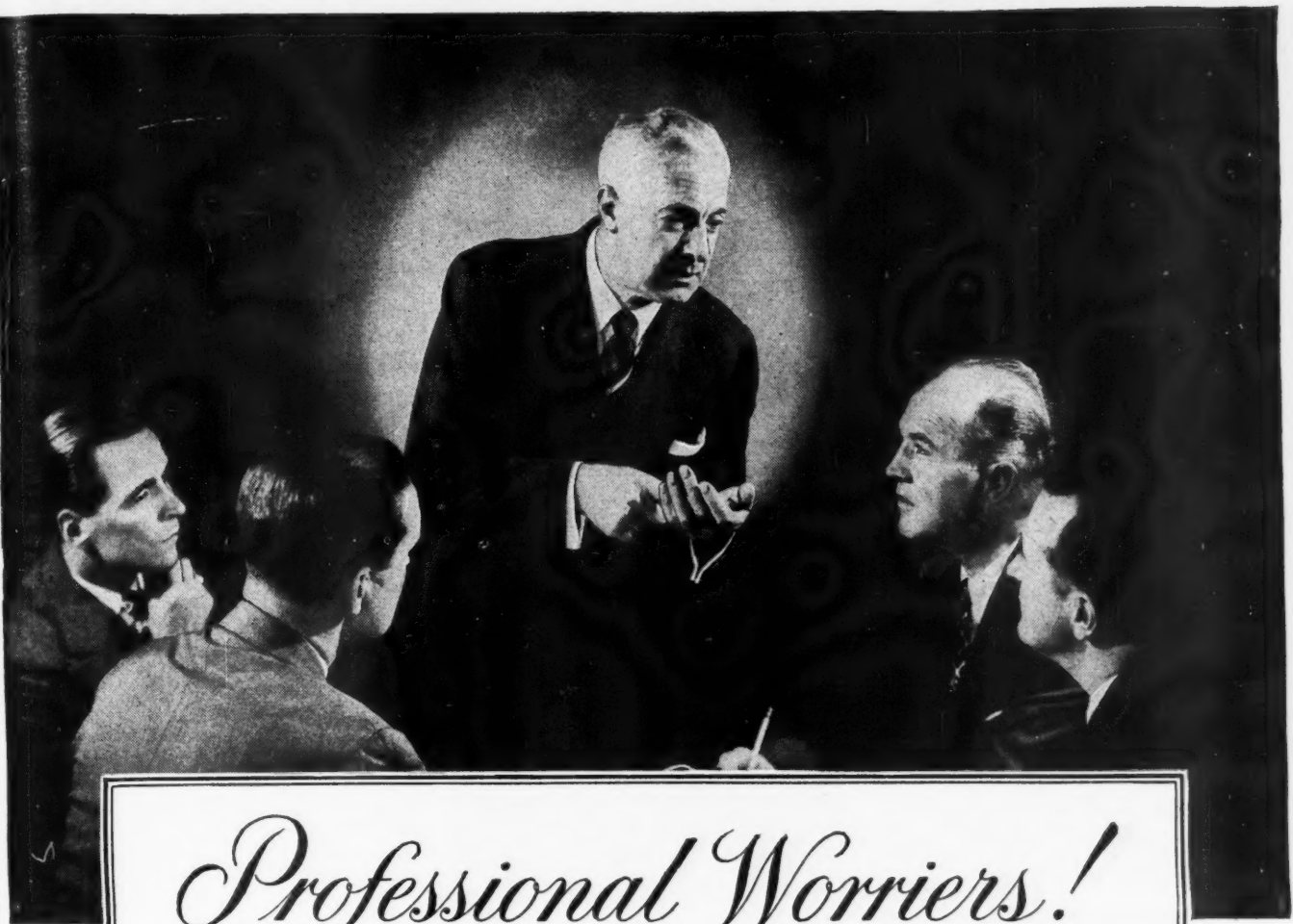
A recent National Safety Council study of 100 mine deaths, Mr. Gedge said, disclosed that defective hoisting equipment was the major cause of the mishaps. Other causes ranged from falls of rock or materials in shafts to failure to close bars or doors, and included such oversights as failure to use a spike to keep a rope from slipping; taking a short cut through a hoisting compartment; or doing a short job between movements of a cage in violation of safety rules. He recommended strict adherence to safety rules and frequent inspection of equipment on a long-range plan to curb accidents.

Two o'clock in the afternoon is the danger hour in coal mines, E. F. Limerick, personnel manager, Consolidation Coal Co. (W. Va.), Fairmont, W. Va., reported. Studies of 1,577 fatalities in West Virginia mines during 1941 to 1945 inclusive, he said, showed that 10.78 percent of them occurred at that hour. Next most dangerous hour is 1 pm. with 6.15 percent of the fatalities. This, he pointed out, indicates the need for special alertness during early afternoon hours.

With the increased competition of oil and gas, Mr. Limerick continued, the coal industry will be forced to attract keen, alert and young personnel. "Safety," he added, "may be the factor that determines the choice of a career for a prospective coal miner."

Aside from the element of human suffering, there is a monetary factor which deserves attention. Recently, he pointed out, it was estimated that compensation, medical costs, loss of tonnage and recovery of equipment from coal-mine accidents cost operators 15c per ton. He recommended a continuous educational campaign to reduce mine accidents, coupled with the installation of modern safety devices.

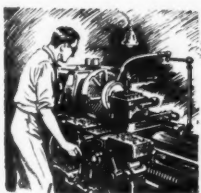
Reviewing the lessons learned from



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Every business, time and again, runs into production snags. When the problem is *lubrication*, we're often called in to do the worrying. And eight times out of ten we come up with the right answer—*fast*. Because that's our job day in, day out, year after year—putting petroleum to work *efficiently*. This backlog of experience, coupled with the world's finest lubricants and fuels, is your best reason for calling Cities Service next time trouble calls on you.

CITIES SERVICE STOPPED TROUBLE HERE!



A screw products company in Cuyahoga Falls, Ohio, called on Cities Service for advice on machining a part of an intricate mechanism made of aluminum that required extreme

accuracy and finish. Chillo Oil No. 22 was recommended. Thereafter, the manufacturer reported the machined work was not only well within the required tolerances, but the work had a mirror-like finish. Tool life was also phenomenally good.

A brick and tile company in Iowa suffered numerous failures of the main drive-shaft bearings in their

Hammer Mill Crushers. Cities Service engineers recommended Pacemaker Oil No. 2. The last report from the company said that since they standardized on this lubricant, no bearing



failures have occurred.

"We use Solvent No. 26 for cleaning surplus oil and grease out of electric clock movements and we find it unexcelled for this purpose" ...so writes the president of an Illinois watch repairing and rebuilding concern after continued use of this



remarkable new Cities Service metal cleaning fluid.

A bus company executive in Cleveland, Ohio, recently said, "During the past four years, we used Cities Service Heavy Duty type oil with outstanding results—minimum wear, freedom from sludge and no engine failures—which has enabled us to give uninterrupted service to our customers."



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Gentlemen: I have a production problem that involves lubrication. I would like to discuss it with one of your lubrication engineers, without obligation, of course.

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A "PAY-OFF" IDEA for that next mine entry

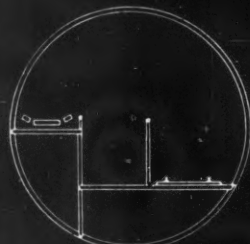
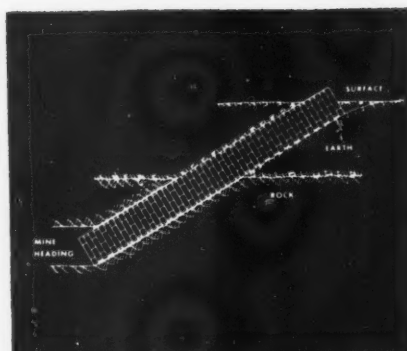
Have you heard about ARMCO Tunnel Liner Plates for sloped entry construction? Here's the simplest, most inexpensive way you ever saw to construct better passageways from ground surface to working levels.

These rugged, corrugated liner plates are designed to assure safe strength without excessive bulk or weight. They provide worthwhile durability and safety from fire hazards. One man can easily handle the light-weight steel sections, bolting them together with ordinary wrenches. Costs are low and the job goes fast.

You'll also find that sinking vertical shafts with ARMCO Liner Plates is an easy, economical way to provide additional ventilation and safety as active workings extend from original mine openings. Write for data on Armco's tunneling methods. Armco Drainage & Metal Products, Inc., 2065 Curtis St., Middletown, Ohio.



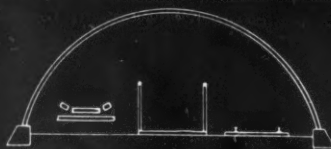
..... ARMCO
TUNNEL LINER PLATES



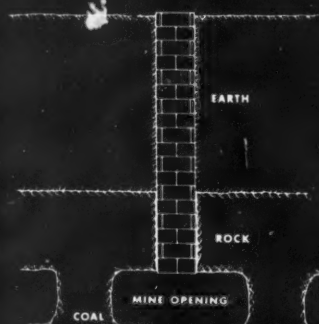
Single large circular opening made with ARMCO Liner Plates contains conveyor, walkway and track.



Building two small openings with ARMCO Plates permits using one for air intake and the other for exhaust. Left—Entry with conveyor and walkway. Right—Entry with tracks.



ARMCO Plates may be used to build single arch-type entry containing conveyor, walkway and track.



the Centralia, Ill., mine disaster of last March 25, M. J. Ankeny, coal mine inspector, U. S. Bureau of Mines, stated that government inspectors have agreed that the explosion was strictly a coal-dust explosion. "If explosions of this type are to be prevented in the future," he declared, "it will be necessary to regard dry and dusty conditions in mines as being imminently dangerous and withdraw men from the mine where such conditions exist until appropriate measures have been taken to remedy them."

Rock-dusting he said, is a means of limiting an explosion, but it is only effective against trouble if applied in all working places up to and including the last open crosscut.

Another lesson of the Centralia disaster, he continued, is that permissible explosives, stemmed with coal dust and fired with fuse in a dependent sequence is dangerous. Maximum safety, he cautioned, will be obtained when all shots are fired in a permissible manner while all men, except the shotfirers, are out of the mine.

Mr. Ankeny further urged that miners be given thorough training in the erection of barricades after a mine disaster. "Evidence indicated" he said, "that 44 men working in two sections of the mine not affected by the explosion could have saved themselves if they had had a knowledge of erecting barricades."

Blowing live steam on coal as it enters a crushing plant has been found to be more effective than water in holding down coal dust, according to James C. Gray, general superintendent of mines, Tennessee Coal, Iron & R.R. Co., Birmingham, Ala. Although the practice has been used only during the past year, he predicted its universal adoption, not only because it is a more successful method of keeping down dust in the preparation plant but also because it keeps down the moisture content in the material.


Mr. Gray also stressed the proper preparation of mine faces and use of water and rock dust to control coal dust underground, particularly important since mechanized mining methods have increased the dust hazard.

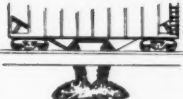
R. Emmet Doherty, of the Anthracite Institute's engineering staff, also spoke of the use of water which, he said, has been accepted as probably the best means to hold down dust hazards in coal mines. Modern compressed air drills, he reported, are now equipped with simplified water attachments, while sprays are coming into general use in undercutting and blasting operations. Water lines at mine faces, he added, have additional value in prevention of mine fires.

In mechanized mining, wood has an important place in preventing roof falls, it was pointed out by W. B. Odendahl, superintendent, Utah Fuel Co., Sunnyside, Utah. Machines now




Speed winter turnaround of cars with coal's best anti-freeze!

"PASS the SALT"

Each winter more and more coal mine operators treat coal with **STERLING** Rock Salt to prevent freezing in transit.  For coal delivered frozen

at customers' yards must be unfrozen for unloading.  Return of cars to mines is severely

delayed and -with the national car shortage-everyone suffers, from consumer to miner! **STERLING**

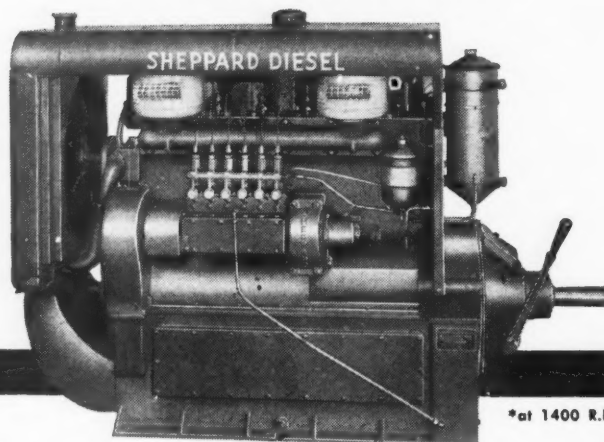
Rock Salt  serves at the mines, too,  by removing snow and ice from roads, scales, tracks, platforms -helping prevent accidents,  delays.

Write today for folder  telling when and how to use **STERLING** Rock Salt!

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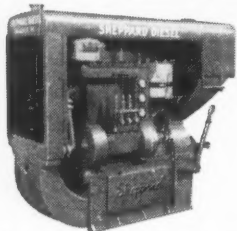


3 1/2 to 62 Continuous DIESEL HORSEPOWER

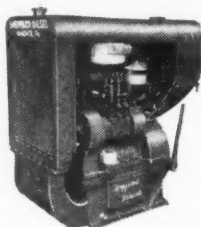


*at 1400 R.P.M.

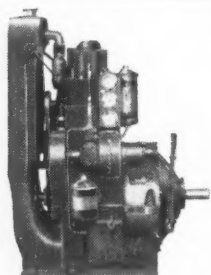
Model 12 - 6 cylinders, 50 H.P. Model 12D - 6 cylinders, 62 H.P.*



Model 6A-1 - 3 cylinders, 25 H.P.
Model 6D - 3 cylinders, 28 H.P.

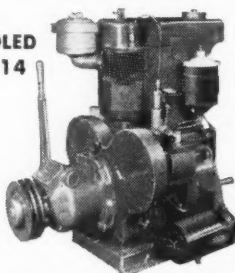


Model 13 - 2 cylinders, 16 H.P.
Model 13D - 2 cylinders, 18 H.P.



Model 7 - 1 cylinder, 8 H.P.
Model 7D - 1 cylinder, 9 H.P.

AIRCOOLED
Model 14



1 cylinder, 3 1/2 H.P. at 1800 R.P.M.
Smallest Diesel built.



Sheppard Diesels are built and *rated* for rugged, *continuous* operation over long periods at 1200 R.P.M. They are of full-diesel design . . . starting and operating on low-cost domestic fuel oil. Standard equipment includes electric starting, power take-off and clutch. Write for complete specifications on the Sheppard Diesel that best suits your power requirements.

R. H. SHEPPARD CO., INC., 11 Middle St., Hanover, Pa.

Sheppard

DIESELS

used are noisy and make it difficult to hear loosening of roof rock or coal. Analysis of roof-fall accidents, he stated, has shown that rigidly enforced, systematic timbering is usually a remedy for the greater number of this type of accidents. In addition to proper timbering, he recommended regular and frequent tests of the roofs, safety inspections and supervision and crew training as other means to hold roof fall accidents to a minimum.

Manufacturers of mining equipment have kept pace in the safety campaign by making various safeguards standard fixtures, said J. E. M. Wilson, district manager, Jeffrey Mfg. Co., Pittsburgh, Pa. "This is manifested," he declared, "by comparing the machine being produced today with those of 15 to 20 years ago."

He promised a continued effort by manufacturers to make equipment even safer, and lauded present maintenance programs of mining firms, which require constant inspection and regulated rebuilding as an assurance for continued safety.

Taking exception, somewhat, to Mr. Wilson's views, Andrew Hyslop Jr., chief engineer, Hanna Coal Co., St. Clairsville, Ohio, said that equipment manufacturing engineers have insufficient knowledge of the peculiar problems in mines. Coal operators, he said, are beginning to realize that trained engineers are needed to maintain new equipment used in the modern mine and to assist manufacturers in designing machinery that will prove safe in operation.

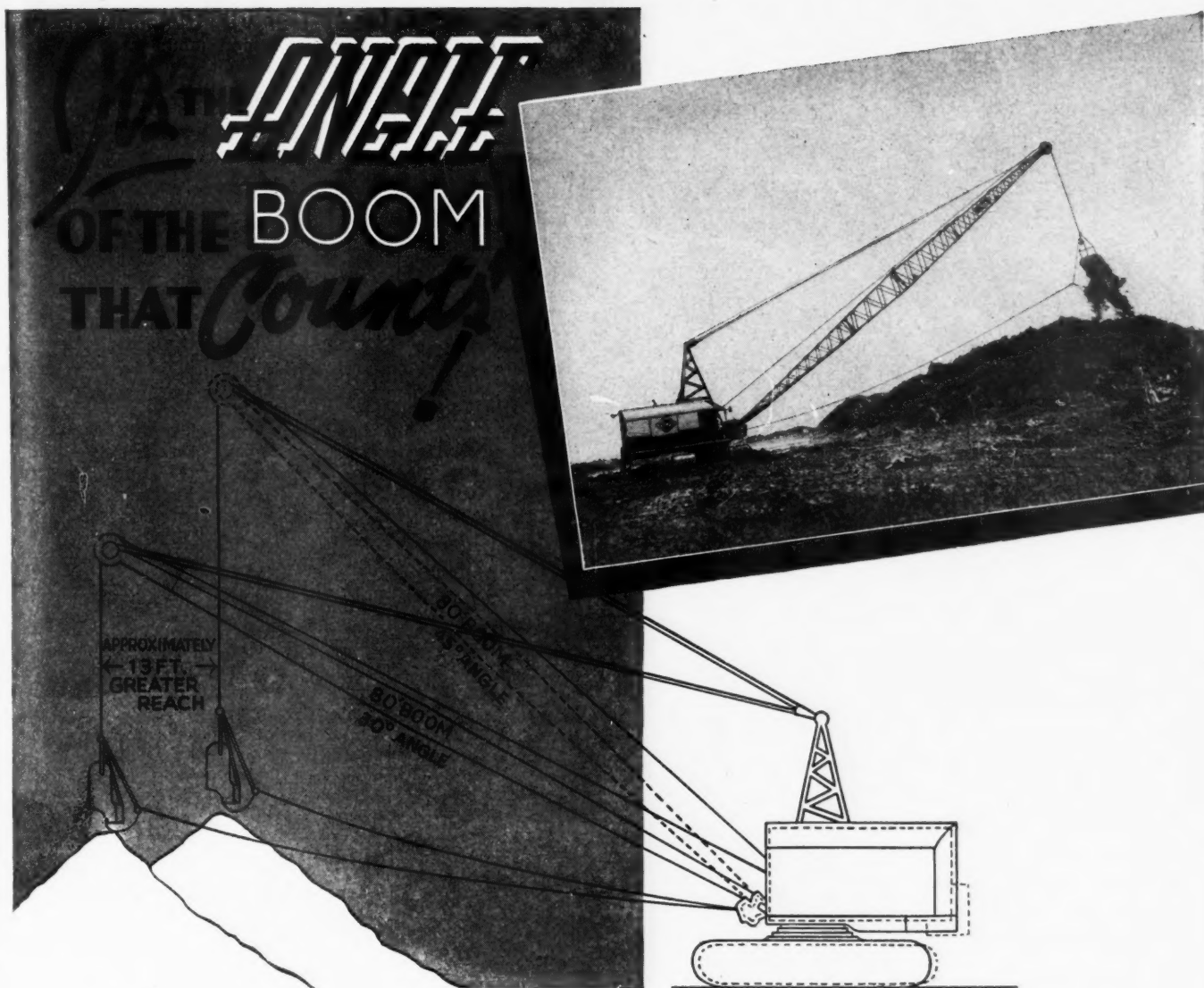
"Competent engineers in the mines," declared Mr. Hyslop, "working in close cooperation with manufacturers, will go a long way toward working out the problem of building safety into machines, as well as that of improving their operating efficiency to reduce the cost of coal."

Mr. Forgie, of American Rolling Mills Co., in his earlier talk, had called on the United Mine Workers of America to extend full cooperation in a safety program with continuous education through every local union in the country.

That some local unions are already doing a creditable job in cooperation with management was revealed by C. E. Jones, safety director, District 29, U.M.W.A., Beckley, W. Va. In 1945, Mr. Jones said, there were 269 fatal mine accidents in West Virginia, but, since establishment of District 29's safety department in January, 1946, there has been a steady decline in mishaps and fatalities.

Chief factor in the accident prevention program, he said, is the appointment of safety committeemen at each mine, whose duty is to work with management in starting safety codes and first-aid training for all miners. A miner trained in first aid, he said, stands six times a better chance of not being injured.

The program, he also explained,



Most dragline work requires the spoil be cast as far back from the cut as possible. Long Booms for such a purpose mean only extra weight if the dragline isn't capable of handling a long boom and load at a low angle. Working range does not depend so much on the length of the boom as it does on the angle at which the boom can be worked without tipping the machine. The accompanying sketch illustrates a comparison in working radii of a well balanced LIMA dragline equipped

with an 80 foot boom and a 3 cubic yard bucket, working at 30 degree angle and a light weight machine equipped with the same length boom and bucket capacity, but which must be worked at 45 degree angle to avoid tipping. LIMA draglines are designed and built for dragline work. Low center of gravity, proper balance, long wide crawlers and big drums, all important advantages for successful dragline operation. Get the facts when you buy your next dragline.

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¾ YARD TO 5½ YARDS

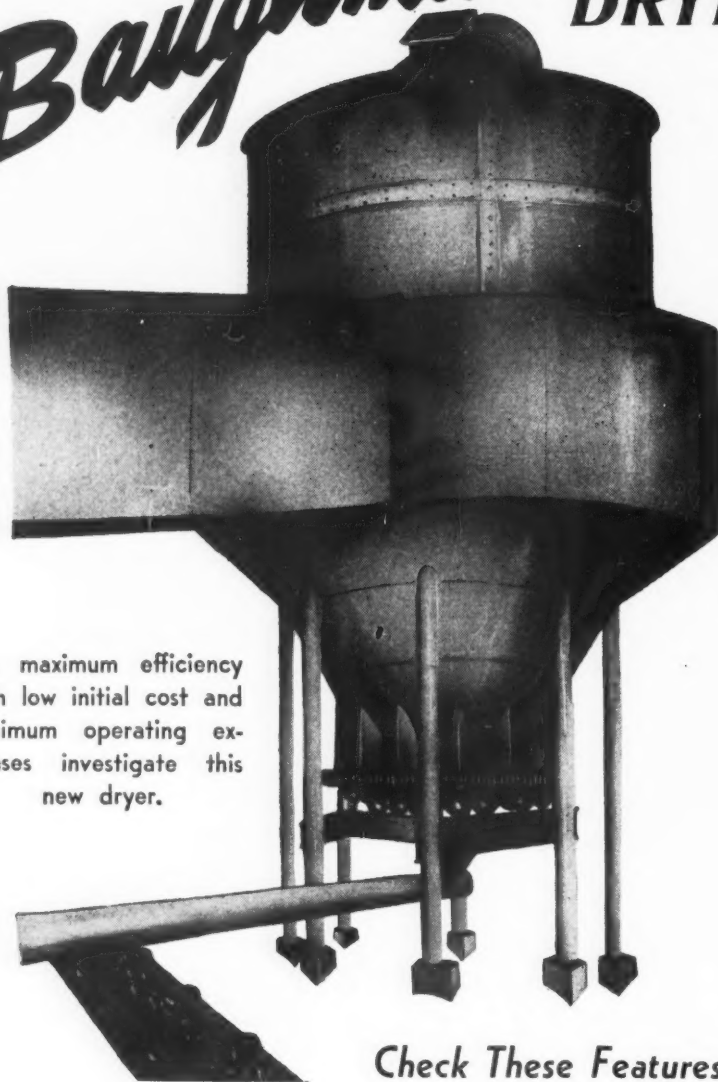
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NEW!

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For maximum efficiency with low initial cost and minimum operating expenses investigate this new dryer.

Check These Features

1. Degradation of product is reduced to a minimum.
2. Slow movement of coal through unit makes possible use of low temperature gases.
3. Low temperature operation prevents overheated product.
4. Lower section of dryer acts as cooling chamber, giving cooler discharge of product.
5. Vertical construction requires a minimum of floor space.
6. Uniform drying without cataracting (smooth continuous flow) eliminates need of dust collectors.
7. No auxiliary equipment required for drying fine coal as fines may be left in product.
8. High thermal efficiency proven by exhaustive tests means more dry product per B.T.U. burned for heat.
9. Low initial cost.
10. Low operating cost.

Write us for further information about Baughman Verti-Vane Dryers. Our sales and technical staffs are always ready to help you solve specific coal handling problems.

ROBERT HOLMES AND BROS., INC.
DANVILLE, ILLINOIS

presents regular instruction in accident prevention for miners and reports to union membership on fatal accidents and their causes, in the hope of avoiding similar mishaps in the future.

Plan Land Reclamation In Ohio and Indiana

Adopting the Illinois practice of sowing abandoned strip-mine lands to pasture, the Maumee Collieries Co., Terre Haute, Ind., has announced plans for sowing spoil banks in Vigo County for the first time next spring. Already, the Ayrshire Collieries Corp., Indianapolis, is developing pasture on its worked-over properties in Vermillion County, according to L. E. Sawyer, director of forestry and reclamation, Indiana Coal Producers Association. Mr. Sawyer pointed out that about 3,000 acres of Indiana strip lands has been planted to trees this year alone at a cost of \$15 to \$20 per acre, with a total of about 2,600,000 trees being set out.

Elsewhere in Ohio, it was announced that more than 100,000 trees have been planted in Columbiana County this year to cover strip-mine spoil banks and other eroded areas, and that the total for the state was approximately 2,000,000 trees.

U.M.W.A. Official Named Assistant Labor Head

John T. Kmetz, close associate of U.M.W.A. President John L. Lewis, was sworn in as Assistant Secretary of Labor on Oct. 1. The new official is a veteran miner and has been a member of the U.M.W.A. International Board for District 1 for 10 years. He served as a member of the U.S. delegation to the International Labor Organization conference held in Geneva, Switzerland, last June and July. Kmetz succeeded Philip Hannah, who reportedly resigned to fight the Taft-Hartley Act as "anti-labor and undemocratic."

Coal Publications

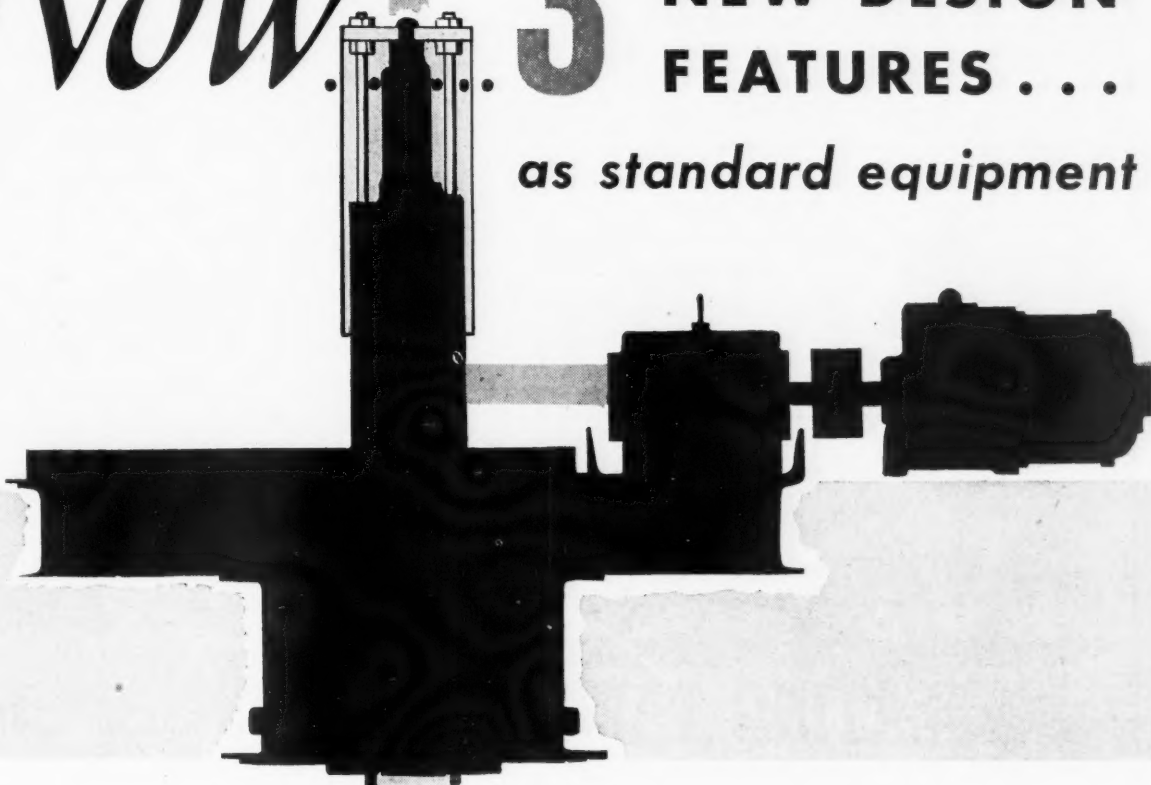
The Guarantee of Annual Wages, by A. D. H. Kaplan. The Brookings Institution, Washington 6, D. C., 1947. 269 pp. 5½x8¾-in.; cloth. \$3.50. Analysis of labor's stand on the guaranteed annual wage, company experiences with stabilization plans and the implications of industry-wide wage guarantees on management-labor relations, business policy, economic structure and government activities. This volume takes issue with the contention that full employment and job security would be promoted by imposing industry-wide annual wage guarantees. Findings are supported by

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FEATURES . . .**

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NEW WEMCO THICKENER saves you time, labor and money 3 ways!

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Hydraulic Lifting Device

. . . for effortless and accurate control in raising or lowering the rakes. No more expended labor on clogged screw devices.

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Spur Gear Mechanism

. . . for greater efficiency and longer gear life by employing the basic rolling action of spur gears. Eliminates the less efficient and wearing-sliding action of worm gears.

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Heavy Duty Shaft Roller Bearings

. . . for more rigid and accurate gear alignment. Greatly reduces lubrication time and attention.

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Low initial cost, continuous operation and minimum operating expense are yours when you use the new WEMCO thickener. To the basic design of strength, compactness and simplicity, these features are added as standard equipment: Lo-Head style, heavy duty shaft, electrically operated overload alarm, and the efficient new cone-drive gear reduction sets that fit any conventional motor drive arrangement. For details to fit your individual needs, write to Western Machinery Company, Dept. D, 760 Folsom Street, San Francisco 7, California.

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Operators say—"20%
MORE EFFICIENT
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Double knee-action; better track-ability. Floating power; less power consumption. Quick acting footbrake, essential for quick stopping, especially behind loading machines. Brake shoes that follow the wheels (due to knee-action). Adjustable Timken Bearings throughout. Huskiest transmission in any storage battery locomotive. Never leaks oil. Never add oil. Use regular auto oil; change every 6 months. Strong. Simple Design. Low maintenance. Backed by over 25 years of experience with Storage Battery locomotives.

**MORE
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 BATTERY
 CAPACITY**

THE
GREENSBURG
"MONITOR"



12 MONITORS

In use by Franklin County Coal Corporation
 8 at Herrin, Ill. 4 at Royalton, Ill.

The Greensburg "Monitor" Type is the first real improvement in storage battery locomotives. **ENTIRELY NEW IN DESIGN.** Its efficiency and economy have been proven in actual mine use. Operators report 20 to 25% more coal hauled than with other battery locomotives having the same battery capacity. From 6 to 10 ton capacities: track gauges 36" to 56½". Other locomotives from 1½ tons to 10 tons, 16" to 56½" track gauge.

THE GREENSBURG MACHINE CO.

Makers of Custom-Built Storage Battery Locomotives

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clear reasoning as well as data on economic fluctuation.

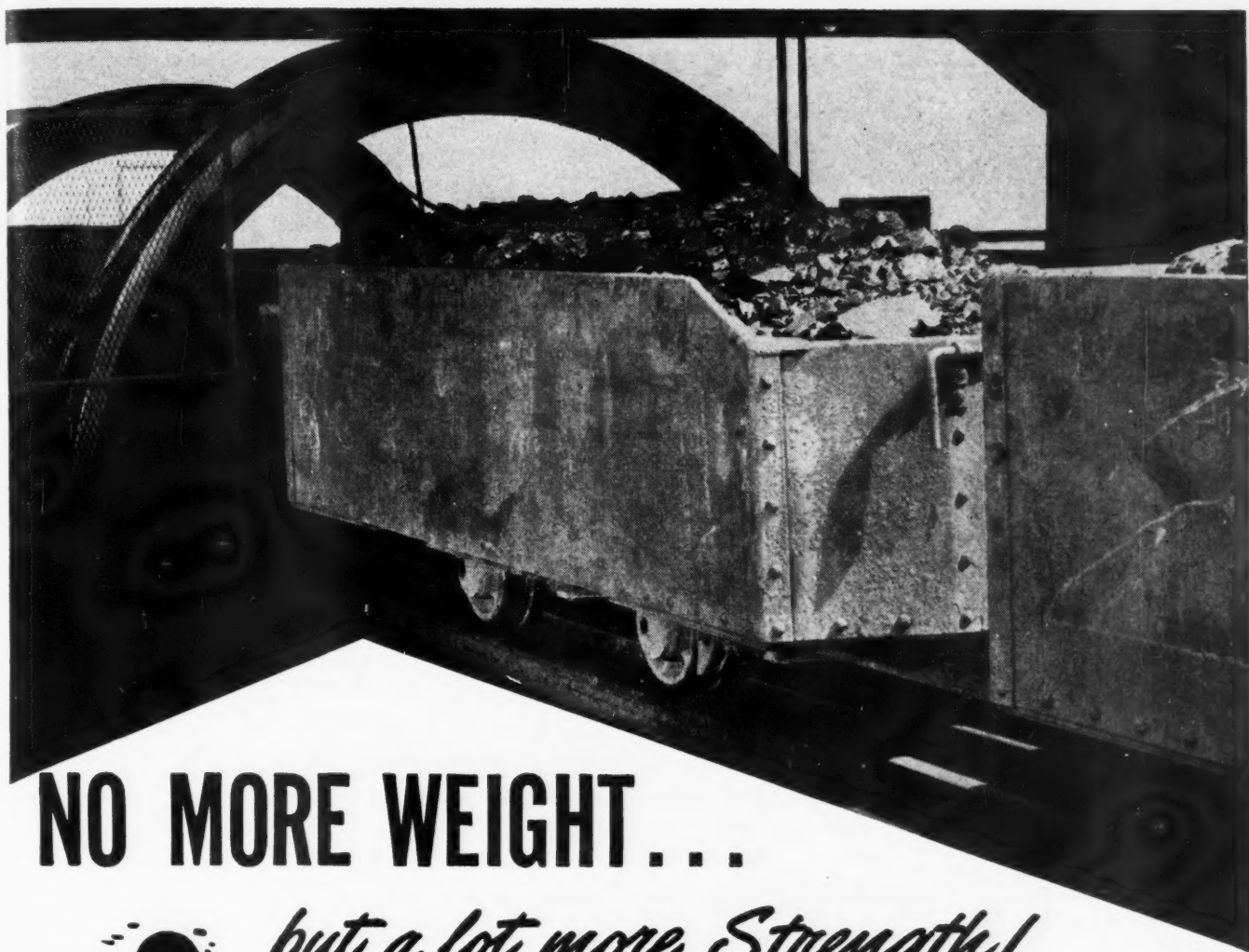
How to Tell Your Company's Story to Employees, Stockholders and the Public. Research Institute of America, 292 Madison Ave., New York 17, N. Y. 56 pp. 8¼x9¾-in.; paper. Helpful suggestions for stating policy, presenting the financial report and backing up the free-enterprise business system.

Overfire Jets and Controls for Locomotive Smoke Abatement, by Eugene D. Benton. Bituminous Coal Research, Inc., Pittsburgh 22, and Fuel Research Laboratory, Battelle Memorial Institute, Columbus 1, Ohio, Technical Report No. VIII, August, 1947. 14 pp. 8½x11-in.; paper. 25c. Recommendations based on engineering research on jet performance and experience from applications to many classes of locomotives under various operating conditions. Specifications for jet design, location, spacing and sizing and for adaptation to hand- and stoker-fired locomotives.

Use of Illinois Coal for Production of Metallurgical Coke, by F. H. Reed, H. W. Jackman, O. W. Rees, G. R. Yohe and P. W. Henline. Illinois State Geological Survey, Urbana, Bulletin No. 71. 132 pp. 6¼x9¾-in.; paper. \$1; one copy free to residents of Illinois and public libraries on payment of 4c. postage. Results of laboratory experiments, pilot-plant carbonization and cooperation of commercial producers of metallurgical coke show that blends of Illinois No. 5 and No. 6 seam coals with eastern coals can be used successfully for metallurgical coke and that sized and cleaned Illinois coal can be safely stocked without hazard of spontaneous combustion.

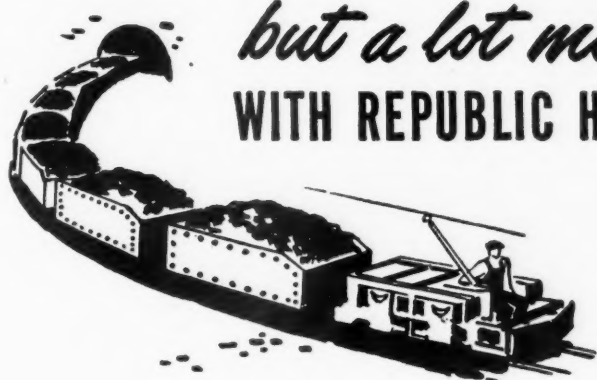
Flood-Prevention Projects at Pennsylvania Anthracite Mines, Progress Report for 1945, by S. H. Ash, W. E. Cassap, James Westfield, W. L. Eaton, W. M. Romischer, E. J. Podgorski and L. H. Johnson. U. S. Bureau of Mines, R. I. 4109. 64 pp. plus 28 pp. of illustrations. 8x10½-in.; paper; mimeo. Free. An interim report on flood and drainage problems and methods, with recommendations for a suitable method of estimating reserves as the first step in establishing a ratio of the value of inundated anthracite to the cost of flood-prevention and drainage projects that will permit safe and economical mining. Discussion of underground water pools, barrier pillars, the "buried valley" of the Susquehanna river, mining subsidence and backfilling and prevention of corrosion of equipment by acid mine water.

Experiment in Underground Gasification of Coal, Gorgas, Ala., by J. J. Dowd, J. L. Elder, J. P. Capp and Paul C. Hen. U. S. Bureau of Mines, R. I. 4164. 62 pp. plus 44 pp. of illustrations. 8x10½-in.; paper; mimeo. Free. The joint undertaking between the Bureau and the Alabama Power



NO MORE WEIGHT...

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WITH REPUBLIC HIGH STRENGTH STEELS



It's difficult to avoid rough handling of cars in modern mechanized mine service. But it is possible to build stronger, more durable cars *without adding weight* by using Republic High Strength Steels.

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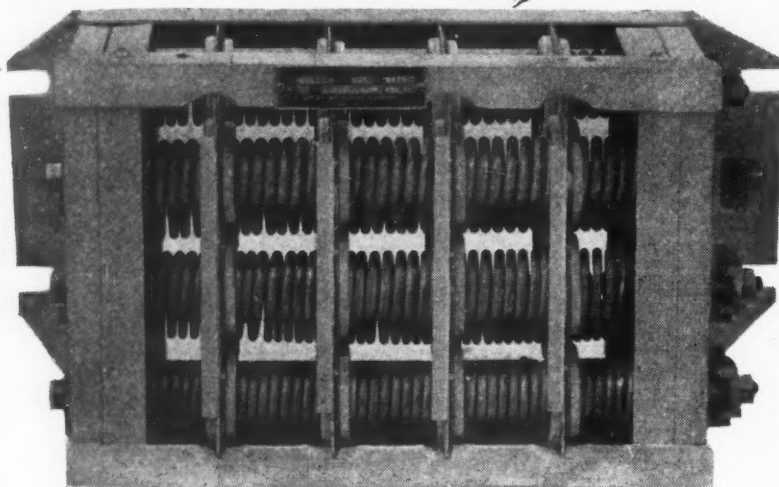
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COAL AGE • November, 1947

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Let us know the model and make of your mining machines and we'll furnish Guyan Resistance units with the same number of taps, numbered the same as the original wiring diagram and with bolt holes that line up!

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A special vehicle for under-
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Hauls men to working face quicker, without fatigue, en-
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We completely overhaul and factory rebuild various kinds
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Co. shows that there was no difficulty in maintaining and controlling under-ground combustion of coal, that coal in place can be completely gasified, leaving only clinker and ash, and that high temperatures generated by underground burning produce changes in the overlying strata that favor the gasification process. By blasting with air, oxygen-enriched air, oxygen-steam-air and oxygen-steam, gas varying from 46.8 to approximately 200 B.t.u. per cubic foot was produced.

Analyses of Arizona, California, Idaho, Nevada and Oregon Coals. U. S. Bureau of Mines, T. P. 696. 83 pp. 5 $\frac{1}{2}$ x9 $\frac{1}{2}$ -in.; paper. 25c., Supt. of Documents, Government Printing Office, Washington 25, D. C. Reserves and analyses of coals in five western states, with a discussion of the status of the coal industry in the area. Coals are sub-bituminous or lignitic and the seams require high-cost development and mining.

Exploration, Reserves, Bed Characteristics and Strip-Mining Possibilities in a Lignite Deposit Near Toledo, Lewis County, Wash., by A. L. Toenges, L. A. Turnbull and W. A. Cole. U. S. Bureau of Mines, T. P. 699. 55 pp. 5 $\frac{1}{2}$ x9 $\frac{1}{2}$ -in.; paper 35c., Supt. of Documents, Government Printing Office, Washington 25, D. C. Description of recoverable reserves of more than 8,000,000 tons of lignite coal and a suggested plan of development. More than 5,000,000 tons of this deposit could be mined by removing overburden averaging 42 ft. on 142 $\frac{1}{2}$ acres to supply fuel-starved industries in Portland, Ore., and the Puget Sound area.

Postwar Levels of Demand for Transportation Fuels Compared With Reserves, by L. E. Peabody, Julian Duncan and Spurgeon Bell. Interstate Commerce Commission, Bureau of Transport Economics and Statistics, Washington 25, D. C. 167 pp. 8x10 $\frac{1}{2}$ -in.; mimeo. Coal used by railways in 1947 and 1948 is estimated at 106 to 116 million tons, depending on national income; oil burned in steam locomotives in 1947 and 1948 is estimated at 3.95 to 4.21 billion gal.; diesel fuel consumption is estimated at 580 million gal. in 1947 and 668 million gal. in 1948. The outlook is for continued growth in use of diesels unless the coal-fired gas-turbine locomotive proves successful. Synthesis of high-B.t.u. gas and liquid petroleum from coal may reach the commercial stage within five years and in fact even earlier if prices of crude petroleum continue to rise. The United States is no longer a net exporter of petroleum and must continue to be a net importer unless (1) the rate of discovery is accelerated, (2) petroleum products are made from coal, (3) proved reserves are permitted to decline or (4) the efficiency of internal-combustion motors is markedly increased.

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thirty-one lb. drill

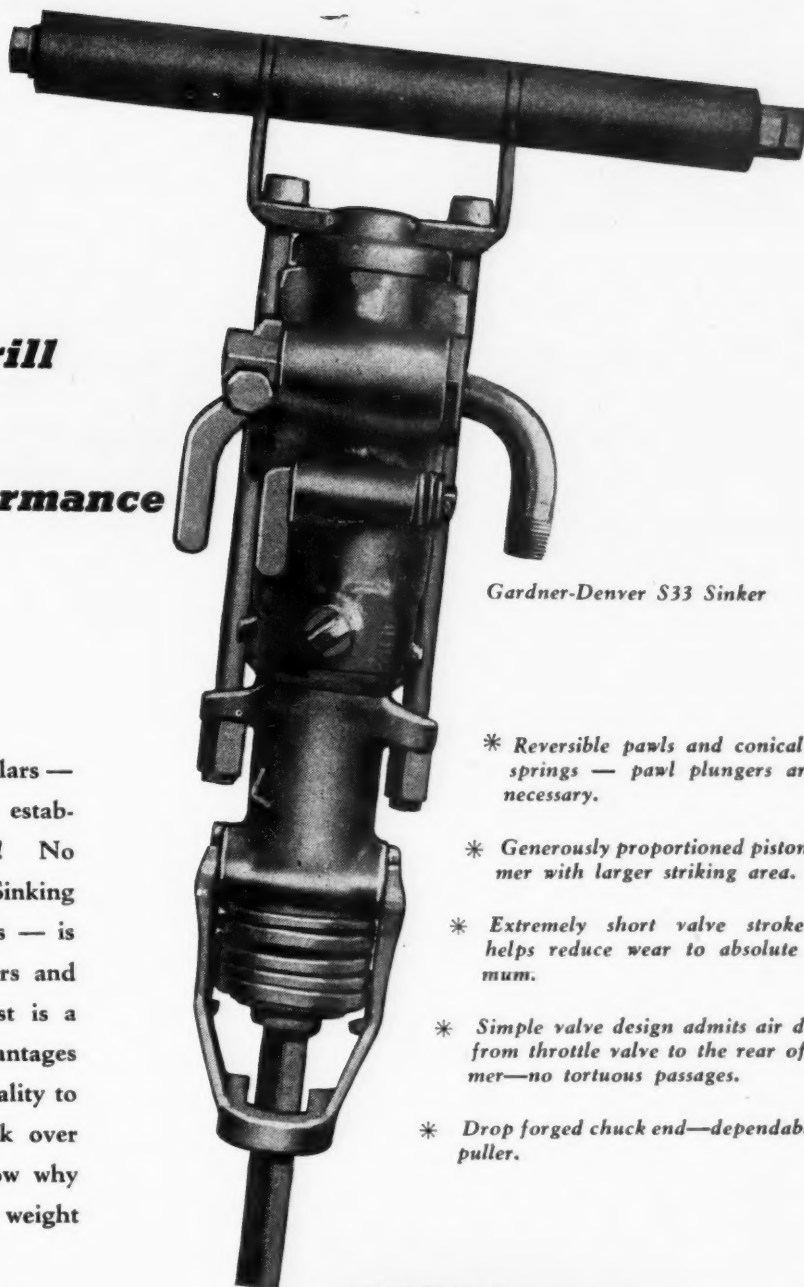
with **BIG Drill** performance

Light enough for use in robbing pillars — yet so fast and powerful that it establishes new performance records! No wonder the Gardner-Denver S33 Sinking Drill — weighing only 31 pounds — is getting so much praise from users and operators alike! For here at last is a lightweight drill with *big* drill advantages — a drill with the stamina and quality to stand up in tough service. Look over these features — then you'll know why the S33 is the champion in its weight class:

For complete information, write
Gardner-Denver Company, Quincy, Ill.

GARDNER-DENVER

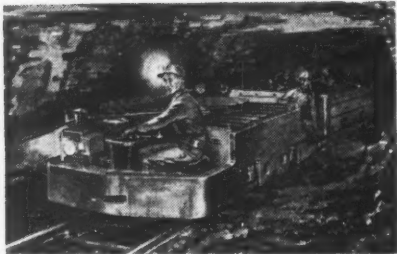
SINCE 1859



Gardner-Denver S33 Sinker

- * Reversible pawls and conical pawl springs — pawl plungers are not necessary.
- * Generously proportioned piston hammer with larger striking area.
- * Extremely short valve stroke that helps reduce wear to absolute minimum.
- * Simple valve design admits air directly from throttle valve to the rear of hammer—no tortuous passages.
- * Drop forged chuck end—dependable steel puller.





Equipment News

More Detailed Information and Descriptive Literature Normally Are Available on Request Directly to the Manufacturer

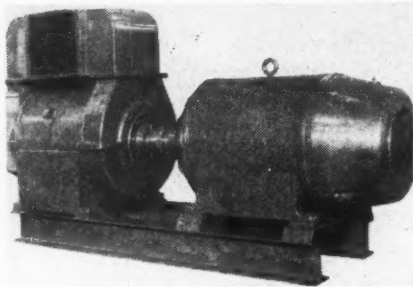
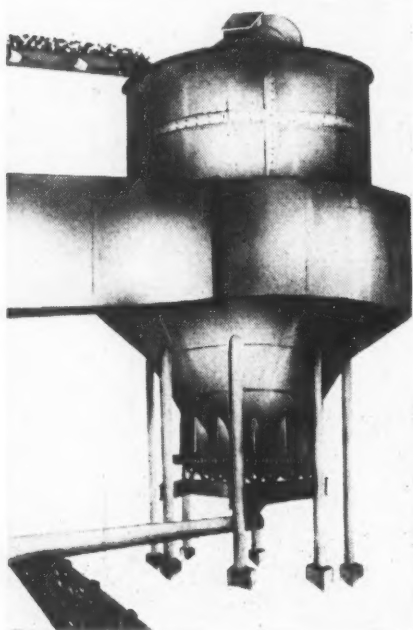
Generators

A new line of totally inclosed unit-cooled generators has been announced by the Motors Division, General Electric Co., Schenectady, N. Y. Available in ratings from 30 to 150 kw., the new generators are designed for use in m.g. sets or in other generating applications in any non-hazardous atmosphere where the ratings involved make totally inclosed fan-cooled construction impractical.

Cooling of the new generator is accomplished by an air-to-air surface cooler that maintains safe winding temperatures at all times, according to the manufacturer. When used in a m.g. set with a GE totally inclosed unit-cooled d.c. motor, the entire unit is shipped by the manufacturer completely assembled and ready for installation.

Dryer

The Baugham Verti-Vane dryer, especially developed for drying of coal, has been announced by the Robert A. Holmes & Bros., Inc., Danville, Ill. The new vertical unit, cylindrical in shape, consists of a revolving inner shell and a stationary outer shell. Coal to be dried moves slowly from a surge bin at the top of the dryer downward between the two shells, with hot air moving from the outer shell through the coal for

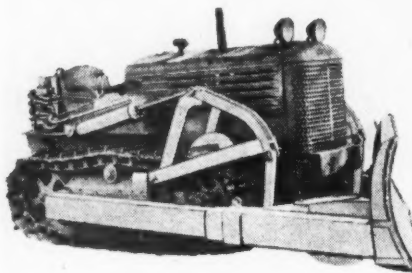


exhaust through the central shell. The coal is gently agitated throughout the entire length of the vertical column and, before being discharged from the central opening at the bottom of the unit, passes through a lower cooling chamber.

Among the features cited for the unit by the manufacturer are: minimum degradation of the product; slow movement of coal, permitting use of low-temperature gases, the latter preventing an overheated product; minimum floor space; elimination of dust collectors because of uniform drying; fine coal may be left in product being dried; and high efficiency of the unit, requiring less heat in operation.

Bulldozers

Featuring a closed hydraulic system with twin pumps, Drott "Twin-Controlled" bulldozers and bullangle dozers, made by the Drott Mfg. Co., Milwaukee 12, are now being sold and serviced by Oliver "Cletrac" dealers

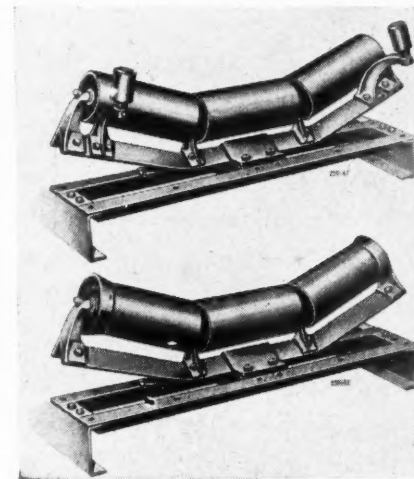


throughout the country. Each of the two pumps operates a cylinder through separate valves and enables the operator to raise or lower either side of the blade from the seat while the tractor is moving or standing still. Other features cited by the manufacturer include close mounting

of the blade to the radiator for better balance, good operator vision and simple, sturdy construction through a "Cradle Lift."

Conveyor Idlers

Improved types of self-aligning idlers for belt-conveyor service have been announced by the Jeffrey Mfg. Co., Columbus 16, Ohio. Shown in the accompanying illustration are the positive-type self-aligning idler with guide rollers (top) and the self-aligning idler with flared, friction-

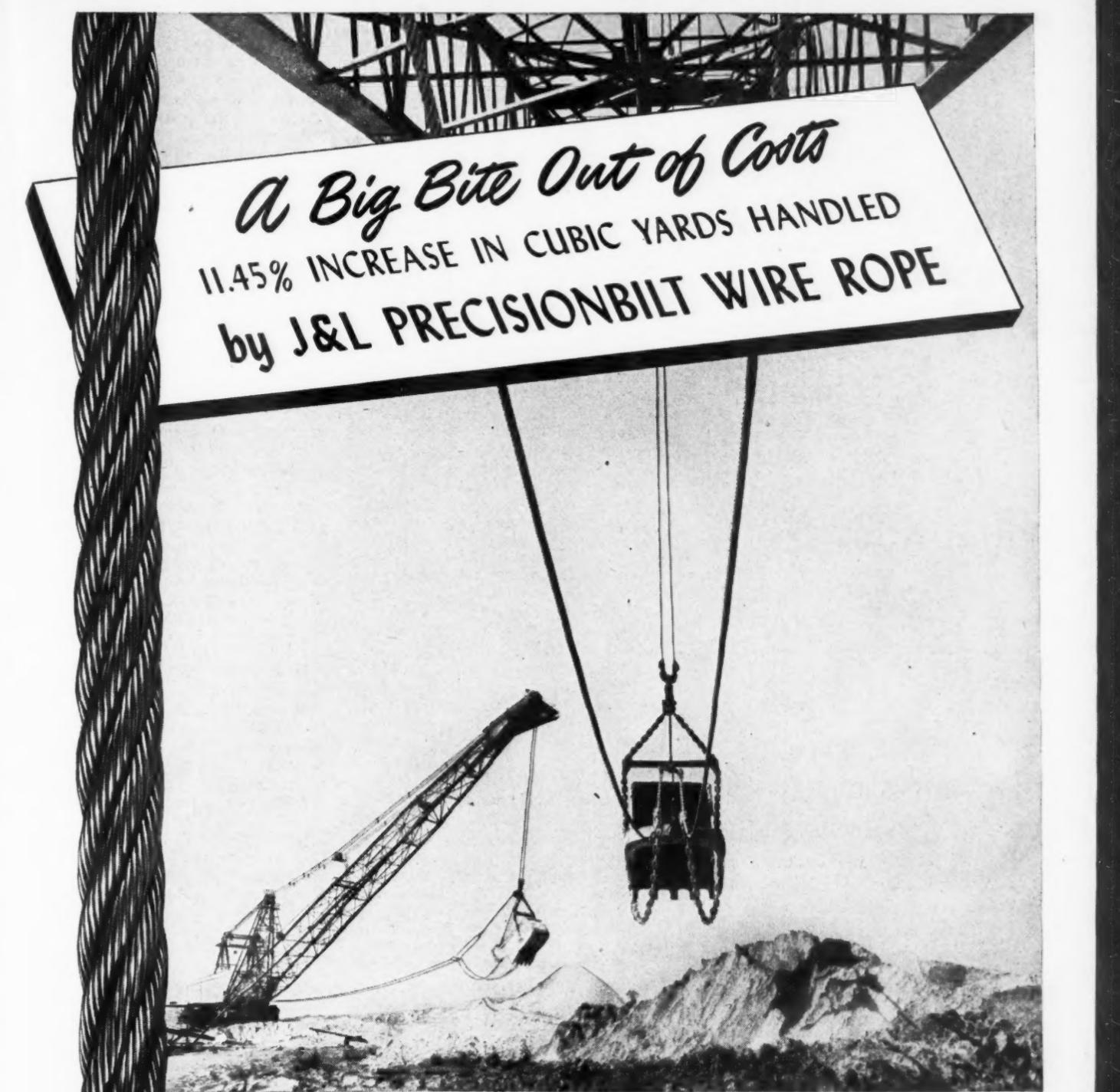


type end pulleys particularly adaptable for reversible belts.

The manufacturer also announces that it has available on request a new 160-page belt-conveyor catalog (No. 785) that, in addition to providing complete data on belt idlers, covers standardized units, with complete information for calculating horsepower, capacities, speeds and other factors required for designing and laying out belt-conveyor installations.

Trolley Guard

The B. F. Goodrich Co., Akron, Ohio, has announced a new trolley guard for underground mine service made from "Koroseal" flexible material. A feature of the new product, according to the manufacturer, is its tear strength, with heavy edges designed to promote better hang and better protection against damage from trolley poles. The guard is said to be flame-resistant and resistant to acids, fumes and mildew. Breakdown voltage, as tested in air, exceeds 20,000 volts.



A Big Bite Out of Costs
11.45% INCREASE IN CUBIC YARDS HANDLED
by J&L PRECISIONBILT WIRE ROPE

This big dragline is operated in the Florida phosphate fields by the International Mineral & Chemical Corporation. Of three brands of drag cables used on it, one brand—J&L Precisionbilt Preformed Wire Rope—handled $1\frac{1}{2}$ times the quantity handled by the next best and nearly three times

the quantity handled by the third brand. This extra service, typical of J&L Wire Rope, is helping to reduce costs in many fields. You can obtain these benefits by ordering from your nearest J&L sales office, distributor or by writing direct to the Wire Rope Sales Department.

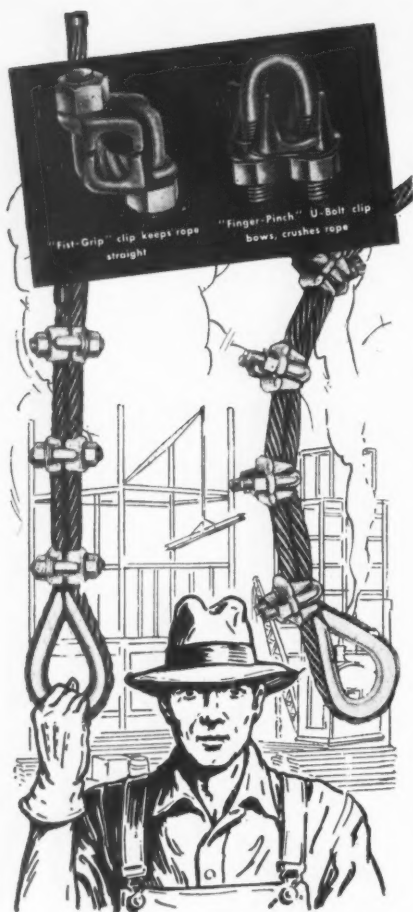
**J&L
STEEL**

JONES & LAUGHLIN STEEL CORPORATION

GILMORE WIRE ROPE DIVISION

PITTSBURGH 30, PENNSYLVANIA

J&L *Precisionbilt* PERMASET PRE-FORMED WIRE ROPE



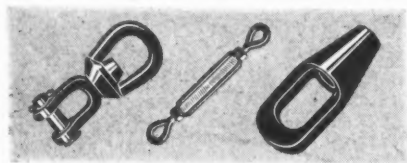
"I'LL TAKE MINE STRAIGHT"

A straight rope is a stronger rope . . . and for maximum strength, rope makers *insist* that kinking and crushing be eliminated. U-bolt clips *always* deform rope . . . particularly if they're "staggered". But LAUGHLIN "FIST-GRIP" CLIPS *insure* a straight rope because four flat bearing surfaces deliver uniform pressure over entire contact area . . . rope stays straight — no reverse bends under load.

"FIST-GRIPS" are foolproof . . . made in identical halves — can't be "staggered" . . . nuts on opposite sides for quick, easy wrenching . . . bolts and saddles drop-forged for strength and SAFETY. Look for LAUGHLIN'S "L" trade-mark at your supply house . . . write for catalog to Dept. 6, The Thomas Laughlin Co., Portland 6, Maine.

LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS



Locomotive Crane

A new "Dieselectric" locomotive crane, in which electric power is used to move the crane along the rails while low-cost diesel power operates the turntable and load-lifting mechanism, has been announced by the American Hoist & Derrick Co., St. Paul, Minn. In addition to hook work, the American Dieselectric is used with grab bucket, grapple, magnet, and for car switching.

Industrial Notes

Lima Locomotive Works, Inc., Lima, Ohio, and General Machinery Corp., Hamilton, Ohio, have announced that they will operate under the name of Lima-Hamilton Corp., effective Oct. 1, with the following divisions: Lima Locomotive Division; Lima Shovel and Crane Division; Hooven, Owens, Rentschler Co.; and Niles Tool Works Co.

General Electric Co., Apparatus Department, Schenectady, has announced a new "integrated operating unit form of management to provide for expanded production," which will consist of separate operating units, to be known as divisions of the department, each with a manager responsible for all phases of business, including engineering, manufacturing and sales.

The new units and managers are: Schenectady, N. Y.: Turbine and Gear Divisions, J. W. Belanger; Control Divisions, K. R. VanTassel; Large Motor and Generator Divisions, J. M. Crawford; Small and Medium Motor Divisions, W. H. Henry; Aeronautic and Ordnance Systems Divisions, W. C. Heckman; Industrial Heating Divisions, C. L. Ipsen; Lighting and Rectifier Divisions, A. F. Dickerson; Wire and Cable Divisions, B. F. Ilsley. Ft. Wayne, Ind.: Fractional-Horsepower Motor Divisions, M. E. Lord; Specialty Transformer and Ballast Divisions, W. C. Wichman. West Lynn, Mass., Works: Meter and Instrument Divisions, N. M. DuChemin. Lynn, Mass., River Works: Aircraft Gas Turbine Divisions, H. D. Kelsey. Pittsfield, Mass.: Transformer and Allied Product Divisions, Robert Paxton. Philadelphia, Pa.: Switchgear Divisions, R. F. Tinnerholm. Erie, Pa.: Locomotive and Car Equipment Divisions, G. W. Wilson. C. H. Matson has been named manager of the Fort Wayne Works.

Timken Roller Bearing Co., Canton, Ohio, has appointed H. C. Edwards, formerly chief engineer of research and development, director of research and development, to succeed J. F. Leahy, who retired Oct. 1 after 45 years of service with the company. Walter F. Green, assistant manager of research and development, has been made manager of research and development to succeed Mr. Edwards.

Westinghouse Electric Corp., Pittsburgh, has named John E. Payne, formerly manager of industrial sales, manager of all industry sales departments for the company, with general over-all responsibility for sales of equipment to all industries. R. S. Kersh, manager of the company's Houston, Texas, office since 1942, has been appointed manager of industrial sales to succeed Mr. Payne. Mr. Payne joined Westinghouse in 1925 and has had a wide experience in sales work for the company.

R. G. LeTourneau, Inc., Peoria, Ill., has named L. A. Welch, executive vice president for the corporation. Mr. Welch, who was deputy director of production in the WPB during the war, is president of the Avery Farm Machinery Co., a director of the Commercial National Bank and a former president of the Hart Oil Co. Elmer E. Isgren, associated with LeTourneau since 1930, has been appointed vice president in charge of production. Mr. Isgren, who also is director of the corporation, for the past year has been manager of the Longview, Tex., plant, where the new Tornadoizer has been placed into production.

Duff-Norton Mfg. Co., Pittsburgh, has named Thomas W. Krueger advertising manager. Mr. Krueger has been with the advertising department of Jones & Laughlin Steel Corp. for the past 10 years, with the exception of a period of three years when he served in the Army Air Corps.

Independent Pneumatic Tool Co., Chicago, has named B. H. Johns, for the past seven years manager of its St. Louis branch, manager of the company's mining and contractors tool sales division, with headquarters at Chicago. Mr. Johns, who has been a member of the Thor sales organization for 21 years, is succeeded by W. B. Smith, former manager of the Houston branch. R. F. Caslin, former Thor electric-tool service engineer in the Houston territory, has been appointed to succeed Mr. Smith as Houston manager.

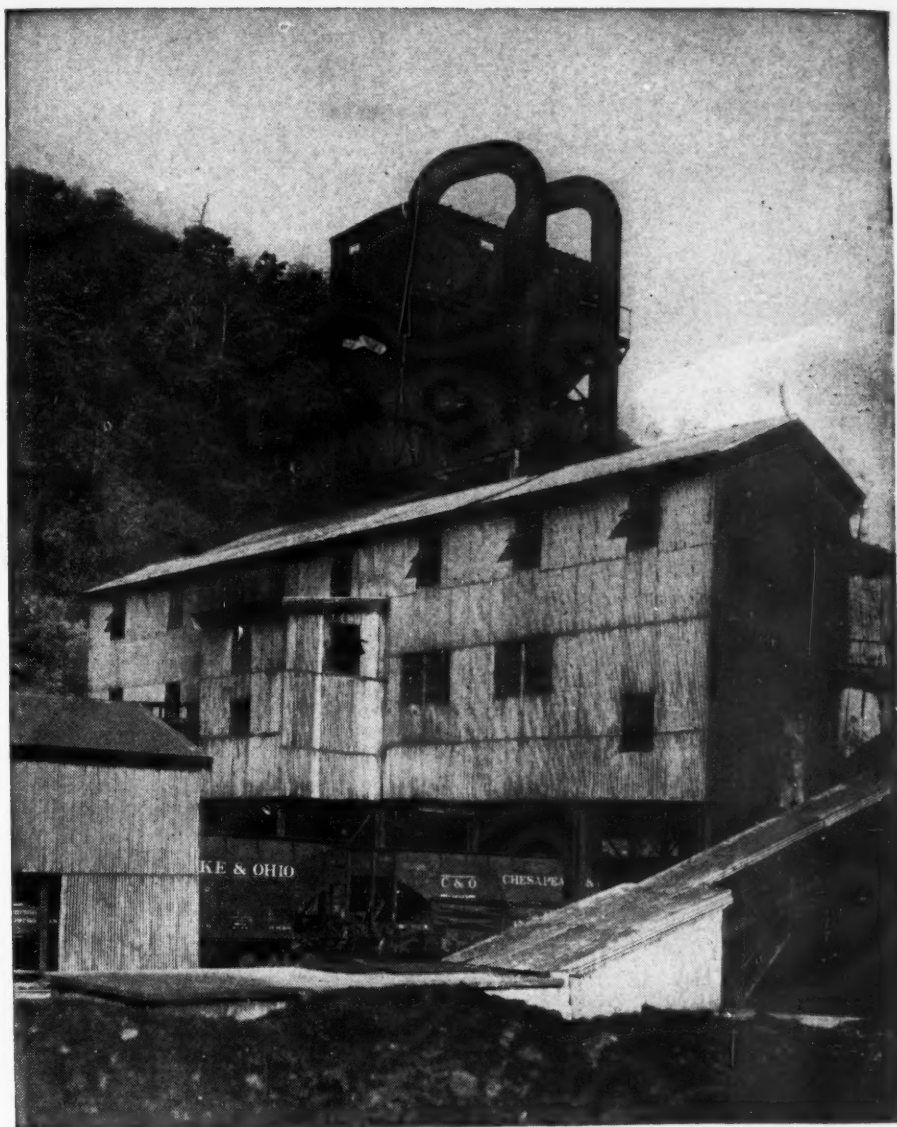
John Flocker & Co., Pittsburgh, has appointed Joseph S. Kirk manager of its wire-rope and electrical-cable division.

LaPlant-Choate Mfg. Co., Inc., Cedar Rapids, Iowa, has named A. W. Schmidt advertising manager, to succeed H. K. Kenyon. Mr. Schmidt, who has been in the LaPlant-Choate organization since 1930, was formerly manager of sales and service training.

Wickwire Spencer Steel Division, The Colorado Fuel & Iron Corp., has appointed L. J. Renner district sales manager at Chicago, succeeding T. H. McSheehy, retired from active service with the corporation.

Hercules Powder Co., Wilmington, Del., has named C. W. Ballard, for-

Pangborn Makes Coal Dust Behave



Desire for increased safety and improved working conditions—lower-cost equipment maintenance—efficient coal dust disposal and reclamation—elimination of nuisances—is responsible for the large number of Pangborn dust control installations in coal preparation plants.

For many years a "Pangborn" has been the recognized method of effectively collecting the fine coal dust that is produced in the operation of tipples, dry cleaning, de-dusting

and other coal preparation facilities.

With this background of successful experience in the coal industry, Pangborn engineers offer you an effective and economical solution to your dust problems.

Write for free Bulletin 909A, "The Control of Industrial Dust". Address Pangborn, *world's largest manufacturer of dust control and blast cleaning equipment*, at 288 Pangborn Boulevard, Hagerstown, Maryland.

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DUST CONTROL

PANGBORN CORPORATION,

HAGERSTOWN, MARYLAND

URNS DUST LOSSES
INTO PROFITS

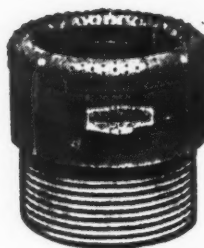


Investigate

this MODERN Core- Drilling Machine

**It's Engineered to Meet
Your Most Severe Demands**

Sprague & Henwood Core Drilling Machines are modern in every respect . . . Can EASILY perform the work expected of them! That's because they are built to meet the demand of present day core drilling work! The machines are high speed, exceptionally sturdy, constructed to withstand rugged service. Available with two distinct types of feeds, "Screwfeed" and "Hydraulic," according to the type of swivel head selected. Have many exclusive features. Write today for full details.



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**Easier and Faster —
with the Amazing New
COFFING HOIST-JACK**

A versatile 3-in-1 tool, this new Coffing Hoist-Jack provides greater efficiency and ease of operation on scores of lifting, pulling or stretching jobs. Simplified ratchet design and sturdy construction assure safety and long life. Weighs only 23 pounds, yet lifts a 2000 pound

load. Operates with stand as a jack, or without stand as a hoist or binder; quickly set up, easily portable. Tested to 100% over rated capacity. Write for Bulletin G-1.



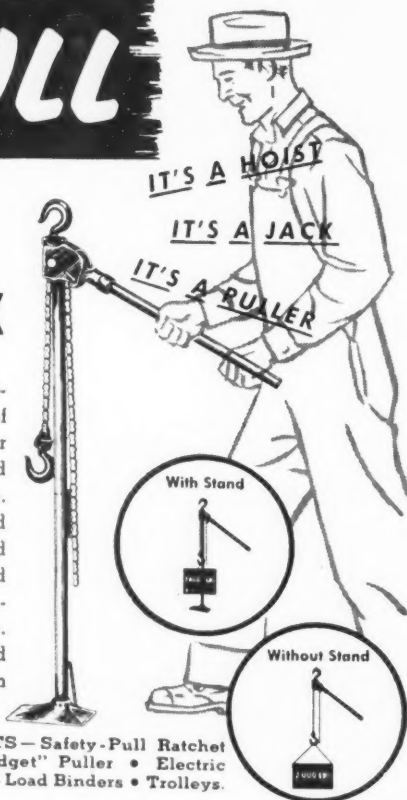
"SAFETY-PULL"
HOISTS
Ratchet Lever
type; Capacities
from ½ to 15 tons

OTHER COFFING PRODUCTS — Safety-Pull Ratchet Lever Hoists • "Mighty-Midget" Puller • Electric Hoists • Spur-Geared Hoists • Load Binders • Trolleys.



COFFING HOIST COMPANY

DANVILLE, ILLINOIS



merly assistant manager of its explosives department district office in Pittsburgh, manager of the office, succeeding John M. Martin, who has been made assistant general manager of the company's Cellulose products department in Wilmington. Mr. Ballard, a native of Ward, W. Va., and a graduate of Marshall College in Huntington, joined Hercules in 1939 as a service man for the explosives department in the Pittsburgh district, later being assigned to sales work and with headquarters in Columbus, Ohio. Prior to joining Hercules, Mr. Ballard was a mining engineer with the Valley Camp Coal Co. and a technical representative of the Cardox Corp.

Stephens-Adamson Mfg. Co., Aurora, Ill., has appointed A. W. Ostberg, formerly purchasing agent, assistant manager of the merchandise division. Mr. Ostberg, who served as Lieutenant, J. G., in the Navy supply corps before joining Stephens-Adamson, will be in charge of the coordination of sales and production of the S-A line of standard box-car loaders, car pullers, winches and speed reducers. E. K. Race has been named as the new purchasing agent.

McNally-Pittsburg Mfg. Corp., Pittsburg, Kan., has appointed Henry E. Kerley assistant chief engineer, in charge of the Pittsburgh, Pa., engineering department. Mr. Kerley joined McNally Pittsburg in 1934 and after being promoted successively to design engineer and section chief, he was transferred to Pittsburgh, Pa., in that capacity in 1945.

Caterpillar Tractor Co., Peoria, Ill., has announced the appointment of three new factory managers. Lloyd J. Ely, formerly factory manager, will head up Caterpillar's new diesel-engine factory, currently under construction and slated for occupancy and partial operation before the end of the year. John Elwood will have charge of all diesel track-type tractor production, moving up from assistant factory manager. Arthur W. Johnson, assistant factory manager, becomes factory manager in charge of the manufacture of such earthmoving products in the company's line as Diesel wheel-type tractors, Diesel motor graders and cable controls, and the final assembly of bulldozers, scrapers and rippers.

Cooper-Bessemer Corp., Mt. Vernon, Ohio, and Grove City, Pa., has named H. A. Gehres executive vice president, and Ralph L. Boyer vice president and chief engineer. Mr. Gehres joined the company in 1910 when it was known as the C. & G. Cooper Co., became chief engineer in 1920 and served in that capacity until 1935, when he was named vice president and director of engineering. Mr. Boyer, who joined Cooper-Bessemer in 1926 as diesel engineer, became assistant chief engineer in 1929, and chief engineer in 1938.



Denver Sales Organization Opens New Warehouse

NEW OFFICE and warehouse facilities, totaling 20,000 sq. ft. of floor space, were formally opened last month at 1626 Wazee St. by Schloss & Shubart, 43-year-old Denver engineering and sales organization. Growth of the Rocky Mountain industrial region and increasing demand for power-transmission, conveying and materials-handling equipment necessitated expansion in the company's facilities, according to officials. Many new units and repair parts will be immediately available from the new warehouse, thus reducing service time considerably, it was said.

International Harvester Co., Chicago, has announced several changes in branch personnel: E. Ingram, formerly assistant manager at Quincy, Ill., has been appointed branch manager succeeding C. R. Frobes, who has

retired. Mr. Ingram joined International at St. Louis in 1928 and, after serving in several capacities, was transferred to Quincy in 1932, being named assistant manager in 1943. R. E. Dunstan, formerly retail man-



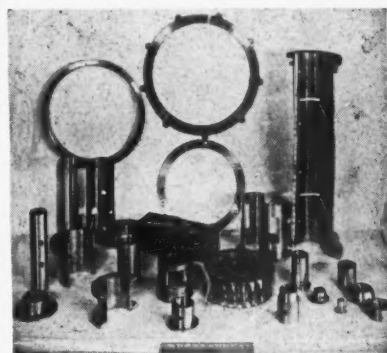
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Round, hexagon, square. Rough cast, semi-finished. Cored stock all sizes (by 1/8" steps) from 1/2" minimum core to 12" O.D. and 12" lengths. 6 grades of hardness.

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Lead or tin base. 3 grades

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BIRMINGHAM, ALA., G. B. Lindstrom Equipment Co. Phone 7-7174
DENVER, COLO., Draper's Service, 1816 St. of Molen. Phone Main 8131
MT. LEANING, PA., J. F. Weaver, 770 Boulevard Ave. Phone LE 9674
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The improved flexible tubing for
mine and tunnel ventilation

This flexible air tubing is ready for immediate, easy installation. On account of its flexibility, it can be put up or taken down in a fractional part of the time required by more rigid means of face ventilation.

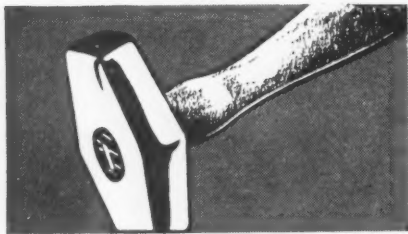
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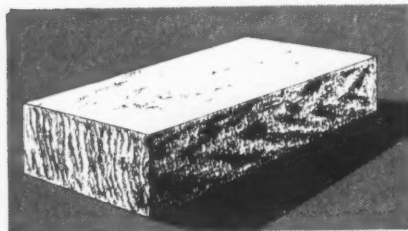
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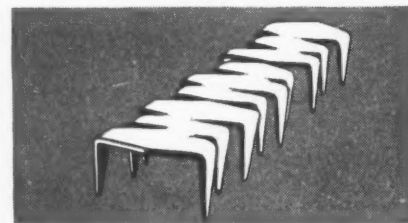
to use this



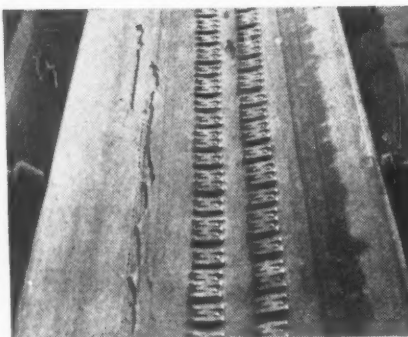
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BRISTOL'S BELT LACING

For rubber or woven conveyor
belts up to $\frac{13}{16}$ " thick.
Write for Bulletin 736.

THE BRISTOL COMPANY
Mill Supply Division
139 Bristol Road, Waterbury 91, Conn.
DISTRIBUTORS EVERYWHERE

ager at New Orleans, has been appointed assistant manager at Columbus, Ohio, motor truck branch. Mr. Dunstan started at New Orleans in 1933 and served in that branch until 1940 when he entered military service. He returned to New Orleans in 1945 and in November, 1946, was promoted to retail manager. The company also has announced the appointment of George S. Menninger, assistant sales engineer, as supervisor of motor truck dealer service, replacing C. W. Leslie, who has been appointed retail manager at the newly opened Archer Avenue service station in Chicago.

Bemis Bro. Bag Co., St. Louis, was one of 40 Midwestern companies recently honored by the award of "Certificate of Public Service" given to trade names "which have been tested by the judgment of the American people for 50 years or more, and have won and held public confidence through unfailing integrity, reliable quality and fair pricing." A. B. Merriam, advertising manager, accepted the certificate for the Bemis "Cat-in-the-Bag" trade mark introduced in 1880, at presentation ceremonies under the sponsorship of the advertising Club of St. Louis and the Brand Names Foundation.

General Electric Co., Pittsfield, Mass., has appointed Addison E. Wiles, formerly assistant manufacturing manager of the company's plastics division, manager of the Pittsfield Molded Products Works, succeeding Arthur C. Treece, who has been named assistant manager of the new GE plastics laminating plant at Coshocton, Ohio.

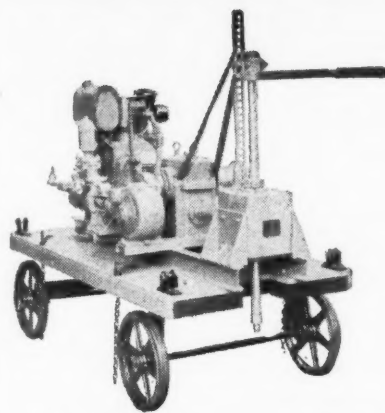
Lincoln Electric Co., Cleveland, has appointed R. H. Newton to a newly created office of manager of dealer sales. Mr. Newton, formerly district sales manager at Minneapolis, will develop an organization to sell and service the recently expanding market in the small manufacturing, service industry and agricultural fields.

Alloy Steel Products Company, Linden, N. J., has named H. E. Johnson Chicago district manager, with headquarters at the new sales office established at 332 South Michigan Ave. Mr. Johnson was previously with Edward Valves, Inc., as sales engineer in the Chicago area, and earlier with the Crane Co.

Gardner-Denver Co., Quincy, Ill., has announced that rapidly increasing demand for its products has necessitated the opening of three new branch offices. M. B. Morrisette is manager of the new branch office in New Orleans, R. A. Williams manager at Cleveland, and E. W. Wallace manager at Kansas City.

Crocker-Wheeler Electric Mfg. Co., a division of Joshua Hendy Corp., Ampere, N. J., has named Paul J. Moore to the newly created position

CORE DRILLS



- Accurate cores of coal seams by using single or double tube core barrels.
- Ideal for determining overburden before strip mining.
- Diamond—alloy or steel shot bits.
- Light weight—easy to move in rough country.

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Our engineering department is capably staffed to make a survey of all motors and generators in your plant and to recommend the proper brushes to be used in each case and compile all technical data into book form for your references. It will be your guide to efficient operation and increased production.

IT'S ABSOLUTELY FREE OF CHARGE!

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of director of sales and engineering. A graduate electrical engineer, Mr. Moore has been engaged in the engineering and selling of electric motors and generators for 24 years.

Goodyear Tire & Rubber Co., Akron, Ohio, has appointed Louis W. Rasor district sales manager for its mechanical goods division, at Charlotte, N. C., succeeding Richard G. Abbott, who becomes district manager at Los Angeles. Mr. Rasor has been the company's mechanical goods representative in Toledo, Ohio, since 1941.

Davey Compressor Co., Kent, Ohio, has appointed Salmon & Co., Inc., Birmingham, Ala., as a Class A direct factory dealer for a territory that includes the counties of Sumter, Green, Hale, Perry, Chilton, Coosa, Tallapoosa and Chambers.

Jones & Laughlin Steel Corp., Pittsburgh, has announced the following personnel changes: S. S. Marshall, Jr., a director, member of the executive committee and vice president in charge of manufacturing operations, has retired after 44 years' service with J. & L. interests. J. B. Mitchell, formerly general manager of manufacturing operations, has been elected a director, member of the executive committee and vice president in charge of operations. E. K. Miller, formerly general superintendent of the Aliquippa Works, and H. D. Stark, assistant general manager of manufacturing operations, have been appointed assistants to the vice president in charge of operations. H. F. Martin, assistant general superintendent of the Aliquippa Works, has been appointed general superintendent. P. H. Devaney, superintendent of hot rolling mills at the Aliquippa Works, has been appointed assistant general superintendent of these works. V. H. Lawrence, a vice president of the corporation, has been elected a director and a member of the executive committee.

Fairbanks, Morse & Co., Chicago, has named James G. Graham sales manager of its railroad division. Mr. Graham joined the Fairbanks-Morse organization about a year and a half ago as district manager of the railroad division.

Hewitt-Robins, Inc., Buffalo, N. Y., has appointed James D. Waser, formerly of Rochester, N. Y., manager of the molded goods sales, Hewitt Rubber Division.

Colorado Fuel & Iron Corp., has appointed J. S. Eskin general manager of sales of the Realock Fence division for the corporation and its subsidiary companies, with offices in Buffalo.

John A. Roebling's Sons Co., Trenton, N. J., has appointed H. S. Christie as manager of the Atlanta, Ga., branch office, succeeding C. G. Mullings, recently retired after 45 years of service in the Atlanta territory.

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"FEMCO" trolleyphones make possible instant voice contact with haulage or gathering locomotives anywhere in the mine . . . eliminates delay, helps move coal faster and permits efficient distribution of empty cars. One operator reported savings of \$40 to \$50 a day with this system! Write for complete information today!

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LOCOMOTIVES ARE
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Freezeproof your coal with

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Unloading coal is a worry when it's frozen in the car. Time and labor are wasted in cracking it. Railway cars are kept idle. Dealers can't meet delivery schedules.

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Coal treated with Wyandotte Calcium Chloride is readily handled at the yard—even in sub-zero weather. It comes out of the car the same grade as it went in—not battered, smashed or cracked. And no special equipment is needed to handle Wyandotte Calcium Chloride for freezeproofing.

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ONLY PIERCE FUSES

have the
**RUGGED
TUBULAR BRIDGE**

- TO MAINTAIN BLADE ALIGNMENT
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Additional exclusive features that mean better protection and lower ultimate cost are:

1. Balanced Lag Link
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FREE: Balanced Lag Link to inspect and test. Specify amperage, voltage.



Trade Literature

Available Without Charge on Request to the Manufacturer

Magnets—Dinos Magnetic Separator Co., 4740 West McGeogh Ave., Milwaukee, Wis. Catalog No. 301-A discusses and illustrates the construction, characteristics and application of rectangular double-gap electromagnetic, suspended, spout and plate magnets and wet-type magnets for submerged installations, for the removal of tramp iron to protect equipment, recovery of tools, etc.

Crusher—Allis-Chalmers Mfg. Co., Milwaukee 1, Wis. Bulletin No. 07B6425 discusses features of the Allis-Chalmers fine-reduction crusher, which are said to enable the unit to handle large capacities of rock or ore with maximum economy, product uniformity and maximum ratio of reduction. Capacities, dimensions and other data are listed.

Transmission Units—Fafnir Bearing Co., New Britain, Conn. Folder LAK covers light series pillow blocks, flange cartridges and cylindrical cartridges equipped with sealed wide inner ring ball bearings. The units said to be applicable for carrying light or normal loads in applications where simplicity of installation is an important factor.

Bulldozers—Caterpillar Tractor Co., Peoria 8, Ill. Bulletin No. 10231 stresses basic specifications, production features and applications of the new Nos. 8A and 7A cable-controlled angling-blade bulldozers, designed for use with the "Caterpillar" diesel D8 and D7 track-type tractors.

Wear-Resistant - Material — Metal Carbides Corp., Youngstown, Ohio. Catalog No. 47WM covers complete prices and specifications on "Talide Metal" for wear-resistant applications and includes 1,325 different sizes of standard solid tungsten-carbide blanks, bars, strips, rods, tubes, bushings, rings, flats, tips, discs and shapes said to be carried in stock for immediate shipment.

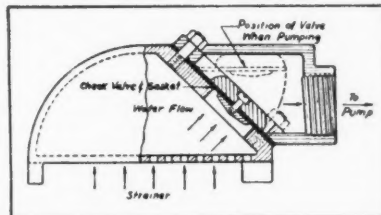
Welding-Fumes Exhauster — Mine Safety Appliances Co., Braddock, Thomas & Meade Sts., Pittsburgh 8, Pa. Bulletin No. CU-1 describes the new M.S.A. portable welding-fume exhauster, designed for use in welding operations where stationary ventilating systems are unavailable or impractical. Designed for operations in cramped, confined quarters or where the welder must move from place to place in inclosed areas, the M.S.A. exhauster is said to efficiently remove harmful welding fumes and provide a clean, safe atmosphere.

Trucks—Mack Trucks, Inc., Empire

G.M.C. COMBINATION FOOT-VALVE STRAINER

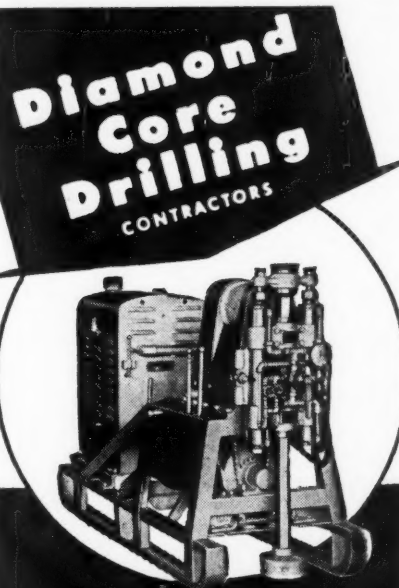
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Gathering Pumps*

A device that answers a long-felt need . . . a combination foot-valve and strainer that has approximately double the straining area of the pipe for which the device is tapped!



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Testing mineral properties with our light gasoline drills. **SATISFACTORY COAL CORES GUARANTEED.** Ground solidification by our pre-pressure grouting method for shafts. Wet mine areas, horizontal holes for drainage. Electric drills for inside mine drilling.

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HUNTINGTON • WEST VIRGINIA**

**PACK 'EM RIGHT
SEAL 'EM TIGHT**



with **QUAKER PACKINGS**

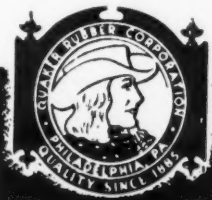
that stop leaks cold . . . keep upkeep down

Don't let costly leaks and drips "drown out" efficiency on your mine operations. For tight sealing of pumps, flanges, valve stems, piston rods—pack 'em tight with Quaker quality packings that give you long-lasting, leak-proof service.

Specially designed for each particular application, they stop wasteful, messy leaks . . . save man-hours . . . cut maintenance costs. That's because Quaker packing ex-

perts make 'em last! They stay soft and pliable, won't harden or dry out, prevent harmful scoring of moving parts.

Remember—there is a Quaker packing for every type of service . . . water, air, gas, oil, acids, at extreme temperatures. And you'll get quick, reliable service on Quaker packings, conveyor belts, air, steam, and water hose by calling your nearest Quaker Distributor.



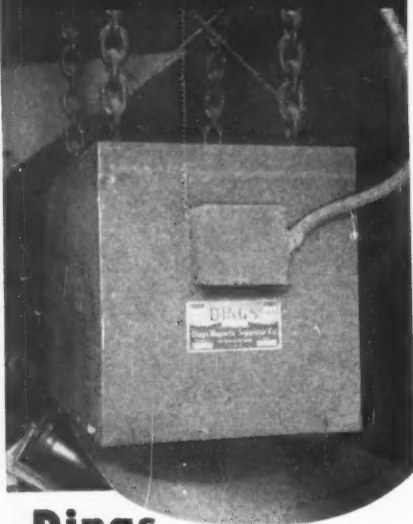
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HEAVY DUTY IRON REMOVAL

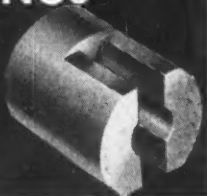


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Put Dings "High Intensity" Rectangular Magnets over heavily-loaded conveyor belts. Tramp iron is snapped up out of the coal burden ... positively protecting your equipment and your customers' stokers. Dings Rectangular Magnets put down a uniform, powerful magnetic field across the entire belt width ... Dings design makes a magnet wider than the belt unnecessary ... Get complete details on heavy-duty iron removal from Dings today.

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A powerful Alnico Magnetic Drill Extractor to save redrilling blast holes when drill rod or bits break off in the hole. Dings Extractors lift up 25 to 40 times their own weight ... Easy to use ... Can be carried in a pocket ... Write for data sheet containing complete information.

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Dings

"HIGH INTENSITY"

State Bldg., New York 1. First post-war issue of "Mack Bulldog," to be published periodically in the future, contains photographs and information on the operation and application of Mack Trucks, suggestions for better service from motor vehicles, etc.

Belting—Hewitt Rubber Division, Hewitt-Robins, Inc., 240 Kensington Ave., Buffalo 5, N. Y. Folder stresses the "job-engineered" features of "Maltese Cross" conveyor belting, now in production after being withheld from manufacture during the war because of government restrictions on use of premium quality materials.

Welding Rods—Eutectic Welding Alloys Corp., 40 Worth St., New York 13. Bulletin, "Eutectic Welder: Overlay Issue," describes specific procedures involved in industrial-equipment salvage and repair welding with various gas and arc rods for producing hard overlay at low temperature. Several new alloys for the hard overlay process are included, along with broad service classifications.

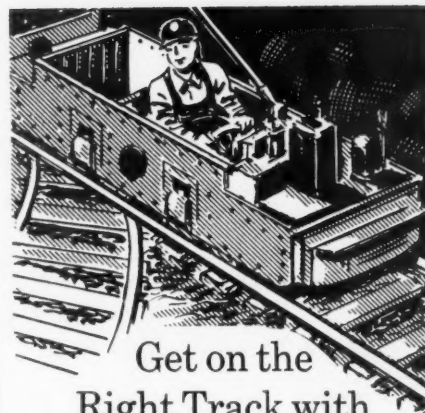
Pneumatic Control Valves and Accessories—Foxboro Co., Foxboro, Mass., Bulletin No. 277-2 covers specifications for control valves, needle-type valves, poppet valves and butterfly valves; the Vernier Valvactor for high-accuracy positioning of valve plungers, and on air switches and sub-panels for remote valve control. Tables and formulae for determining the size of the correct valve are included, along with data on air-filter sets, ventilating dampers, and other accessories.

Welding Rods—Titan Metal Mfg. Co., Bellefonte, Pa. Folder outlines the characteristics and use of Titan bronze welding rods, and lists in table form the approximate chemical and physical properties of seven types of welding alloys.

Fire Extinguishers—B. F. Goodrich Co., Akron, Ohio. Catalog section covers the Goodrich line of hand carbon-dioxide fire extinguishers, made in four sizes, with the carbon-dioxide charges of 2%, 4, 10 and 15 lb. Construction of the extinguishers and specifications, including total weight and type of nozzle connection, are included.

Electric Generating Units—D. W. Onan and Sons, Inc., Minneapolis, Minn. Catalog No. A-138 describes electric generating plants in sizes ranging from 350 to 35,000 watts a.c. in all standard voltages, frequencies and phases; 115-volt d.c. models from 600 to 10,000 watts; 230-volt d.c. models from 3,500 to 10,000 watts; and battery-charging plants, 6, 12, 24, 32, and 115 volts in sizes from 500 to 6,000 watts.

Packing—B. F. Goodrich Co., Akron, Ohio. Catalog section describes and gives data on various types of Goodrich "Super-Heat" com-



Get on the Right Track with Mescoweld Rail Bonds

YOUR POWER DOLLAR goes farther when you use MES-COWELD Rail Bonds. They are Flashwelded by a patented process which securely attaches terminal to cable and assures a more oxygen-free weld. Efficient, more economical bonding is the result. Write for catalog describing 18 standard types of bonds.



Type M8-F

Mosebach Electric & Supply Co.
1115 Arlington Avenue Pittsburgh 3, Pa.
HEmlock 8332

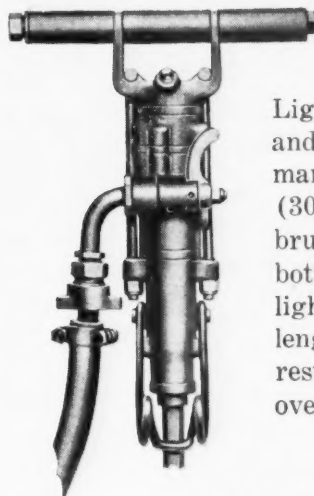
PRESSURE CONCRETE

(GUNITE SYSTEM)
by HUDSON RUMSEY CO., INC.

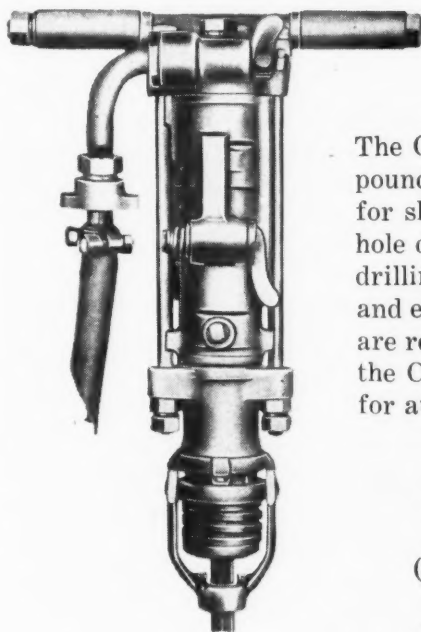
- For
Repairs & Construction of
- MINE TUNNELS
 - BUILDINGS
 - BRIDGES
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**HUDSON RUMSEY
CO. INC.**
1200 NIAGARA ST. BUFFALO, N. Y.

CP Sinker Drills for coal mine jobs

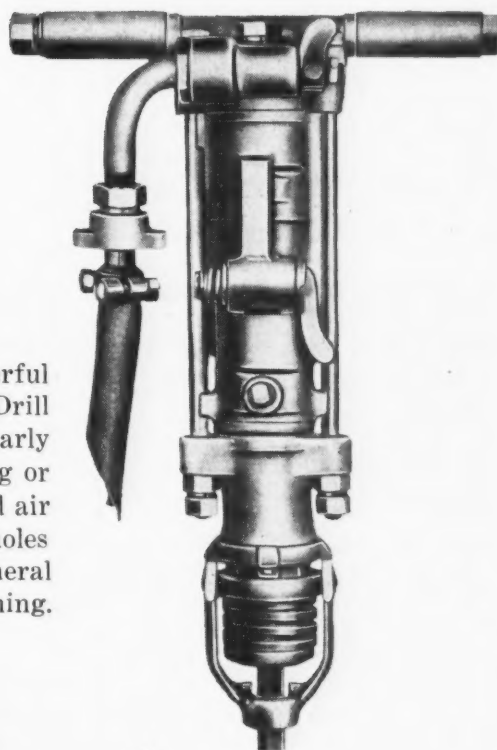


Light, perfectly balanced and easily operated by one man, the CP-22 Sinker Drill (30 pound class) speeds brushing down, taking up bottoms, and coal drilling. Its lightness and short overall length make it ideal for use in restricted quarters and overhead operations.



The CP-32 Sinker Drill (45 pound class) is recommended for shaft sinking and long hole drilling, where fast drilling speed, strong rotation and exceptional hole cleaning are required. Where desired, the CP-32 can be adapted for auger work.

The fast drilling speed and powerful rotation of the CP-42 Sinker Drill (55 pound class) make it particularly suitable for sinking, benching or heavy block-boring. Its powerful air blow keeps even the deeper holes free from cuttings. Ideal for general utility work in strip mining.



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General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

COAL AGE • November, 1947

Write for Bulletin 850.

pressed asbestos-sheet packing, rubber-sheet packing, cloth inserted packings and "Koroseal" sheet packing.

Heaters and Thawers—Hauck Mfg. Co., 124-136 Tenth St., Brooklyn 15, N. Y. Catalog No. 1047 describes and illustrates the Hauck line of heaters and thawers, including two new portable wheeled thawing units and a ground-thawing unit.

Rubber Footwear—B. F. Goodrich Co., Akron, Ohio. Catalog section describes the Goodrich line of industrial rubber footwear, including boots,

rubbers, gaiters, work shoes and pacs.

Underpasses and Service Tunnels—Armco Drainage & Metal Products, Inc., Middletown, Ohio. Manual illustrates and describes construction of underpasses and tunnels for passage of personnel and materials with ARMCO metal structures and includes data on sizes and shapes of openings. Several pages are devoted to aggregate conveyor tunnels.

Wrenches—Blackhawk Mfg. Co., Milwaukee 1, Wis. Catalog No. 247 lists the Blackhawk line of socket, box-type and open-end wrenches and

sets, including new "Nugget" double-duty drive-socket wrenches.

Earthmover—R. G. LeTourneau, Inc., Peoria, Ill. Broadside No. TD-109 describes and illustrates the construction, features and applications of the new Model C Tournadozer, which is said to have four speeds up to 15 m.p.h., both forward and reverse. Specifications of the unit are listed.

Chemical Consulting Service—Foster D. Snell, Inc., 29 West 15th St., New York 11. Folder outlines the analytical services offered by this consulting organization, said to include chemical engineers, bacteriologists and medical personnel.

Protective Clothing—Industrial Products Co., 2820 North Fourth St., Philadelphia 33, Pa. Bulletin describes and lists prices of protective aprons, gloves, IPCO car-door opener and other safety equipment available.

Building Maintenance—Stonhard Co., 814 Terminal Commerce Bldg., Philadelphia 8. Folder, "15 Building Maintenance Problems," discusses such problems as leaky roofs, worn flashings and gutters, rough concrete and wood floors, concrete dust, spalled walls, loose pointing, etc.

Recorder—Wheelco Instruments Co., Chicago 3. "Educational Bulletin No. 7" describes the Wheelco Capacilog and includes operational diagrams, schematic drawings, charts and listings of the diversified functions of this new strip-chart recorder.

Steam Purifiers—Cochrane Corp., Philadelphia 32, Pa. Bulletin 2725 includes application data, hook-up diagrams, installation photographs, and accessories on steam-purification units for the removal of moisture and solids in steam lines.

Laboratory Equipment—Eberbach & Son Co., Ann Arbor, Mich. Booklet, "Announcer of Scientific Equipment," discusses "Functional Design of Laboratory Glassware," and also covers recent developments of apparatus and supplies designed to aid laboratory work.

Bulldozers—Caterpillar Tractor Co., Peoria 8, Mo. Bulletin No. 10360 illustrates and describes the versatility of earthmoving, cable-controlled bulldozers and includes many on-job photographs of bulldozers mounted on various models of "Caterpillar" diesel track-type tractors.

Detergent and Wetting Agent—Miranol Chemical Co., Inc., 2 Ford Ave., Milltown, N. J. Booklet outlines the properties, characteristics and applications of Miranol synthetic organic detergents and wetting agents.

Laboratory Chemicals—Burrell Technical Supply Co., 1942 Fifth Ave., Pittsburgh 19, Pa. Catalog No. 247 lists laboratory chemicals, with special listings of interest to clinical, steel, and gas analysts.

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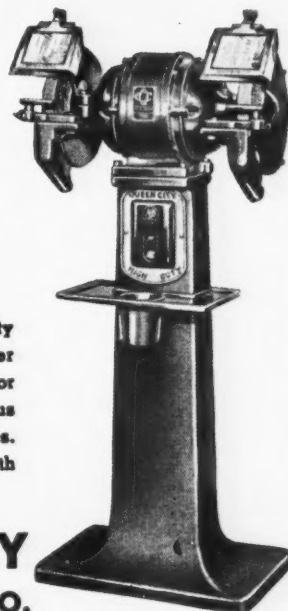
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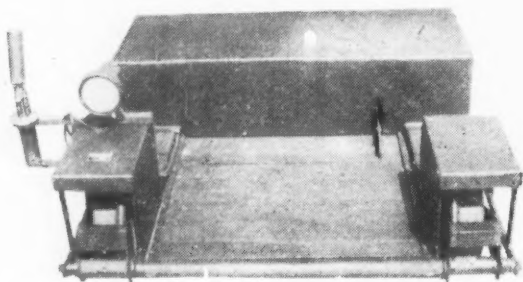
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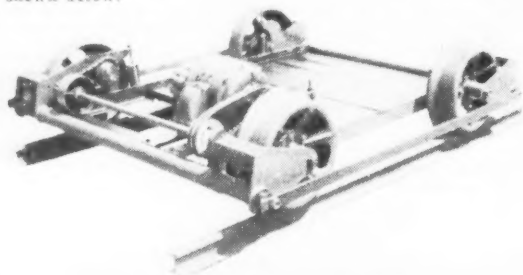


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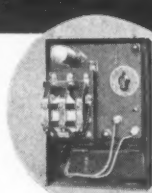


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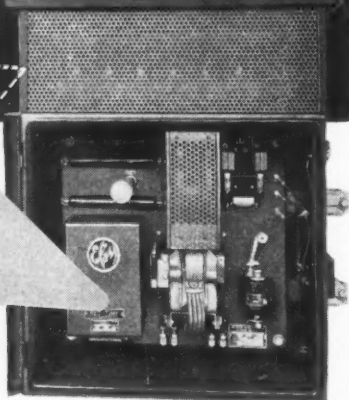
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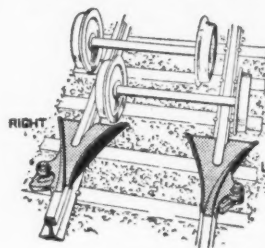
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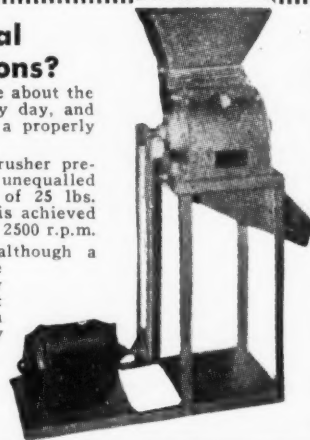
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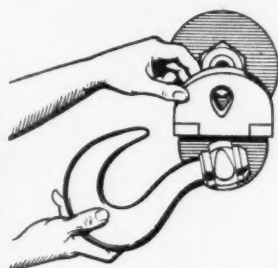
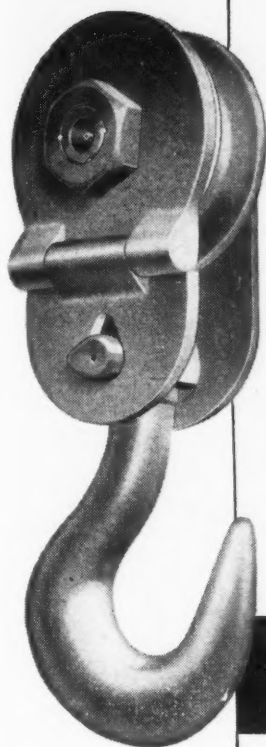
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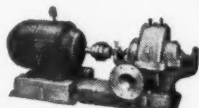
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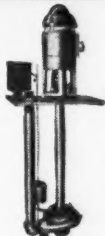
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for all conditions—4" to 24"



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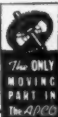


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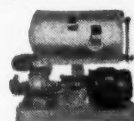


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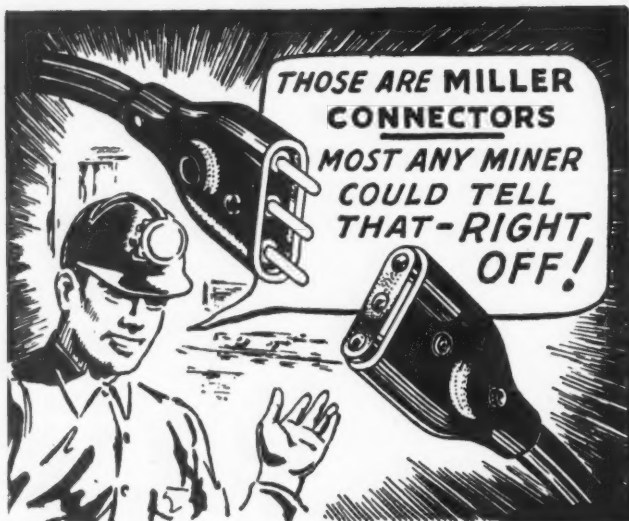
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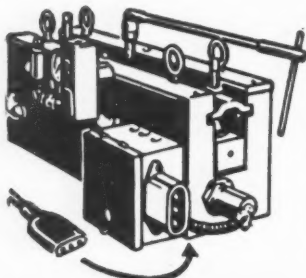
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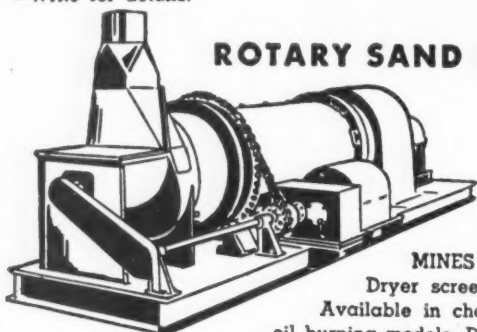
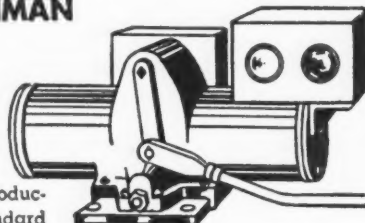


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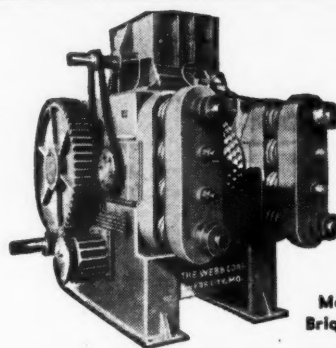


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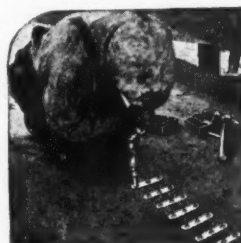
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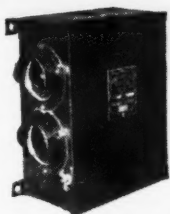
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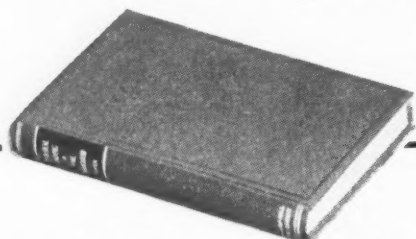
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POSITIONS WANTED

Accountant, 8 years' experience in all phases of coal accounting, desires position with reliable and progressive coal company. Was assistant to manager of large strip mine. Will assume full responsibility of department. Applicant is also author of system for strip mine accounting. Write PW 1963, Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

COLLEGE GRADUATE, Registered Engineer, experienced thin seam mechanical mining. Desires responsible position with reliable company, preferably in Southern West Virginia. Write PW 2654, Coal Age, 330 W. 42nd St., New York 18, N. Y.

MINING MAN Available. 35 years' experience engineer, foreman, inspector, superintendent. Energetic. Thoroughly reliable. Write PW 2828, Coal Age, 330 W. 42nd St., New York 18, N. Y.

MINING ENGINEER. Presently employed Chief Engineer large non-metallic mine and processing plant desires affiliation with progressive coal operator where a comprehensive mining, mechanical, civil and electrical background can be utilized. Experienced in design and construction crushing plants, car loading facilities, material handling systems, high stress conveyors. No previous experience in coal. Age 42. Graduate Colorado School of Mines. Write PW 2814, Coal Age, 68 Post St., San Francisco 4, Cal.

BUSINESS OPPORTUNITIES

Haulage Contractors

on large coal job. Good roads, long haul, together with long term contract. Must have large equipment. Southern field. BO-1532. Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

Illinois Going Coal Mines

for sale 500 tons daily to 2,000,000 annually. If you want to increase your output, producers, write Wm. H. Jordan, 712 North Dearborn Street, Chicago, Illinois.

Desire to Buy

small or medium sized mechanized mine in Appalachian field. Write details to BO-2727, Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

COAL LANDS

Suitable for strip mining. Complete details upon request.

G. B. LORRAINE

Low Building, Richmond 19, Va.

WANTED

Coal Stripping Excavators

For long time job in high priced field, high quality coal, gentle rolling cover. Mostly shale and dirt in Southern field. Job calls for stripping and loading into our trucks.

P. 1530, Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

WANTED TO BUY

MINE CARS, WOOD OR STEEL

3 1/2 to 5 Ton, 42" Gauge, lift end.

Write

KONYA COAL CO.
Rivesville, W. Va.

Have you idle Electrical Equipment?

Turn it into CASH!

We Purchase:

Traveling Cranes
A. C. and D. C. Motors
Rotary Convertors
Motor Generator Sets
Transformers
Starting Equipment

Your listing will receive our prompt attention.

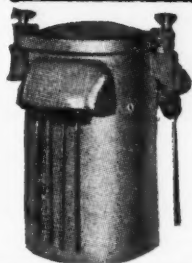
MOTOR POWER COMPANY OF NEW YORK, INC.

859 Madison Avenue

New York 21, N. Y.

RHinelander 4-6478

-TRANSFORMERS-



TRANSFORMERS WANTED

in operating condition or burnt out. Mail us list giving complete nameplate data and stating condition.

We Rewind, Repair and Redesign All Makes and Sizes
ALL TRANSFORMERS GUARANTEED FOR ONE YEAR

THE ELECTRIC SERVICE CO., INC.

"AMERICA'S USED TRANSFORMER CLEARING HOUSE"
Station M Since 1912 CINCINNATI 27, OHIO

WANTED

3/4 to 5 yard Shovels
2 to 10 yard Draglines

Tractors and Dozers

Frank Swabb Equipment Co., Inc.

Hazleton National Bank Building
Hazleton, Pa.

Telephones 4911 and 4910J

WANTED

DUMP CARS

THIRTY-SIX INCH GAUGE BOTTOM DUMP CARS, FIFTEEN, TWENTY OR TWENTY-FIVE YARD CAPACITY.

W. 2703 Coal Age

520 N. Michigan Ave., Chicago 11, Ill.

WANTED

Two (2) Northwest 80-D Shovels, new or surplus.

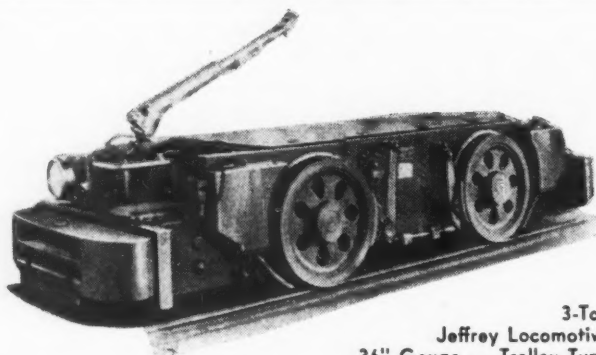
SUNNYHILL COAL CO.

Telephone Lehigh 1001

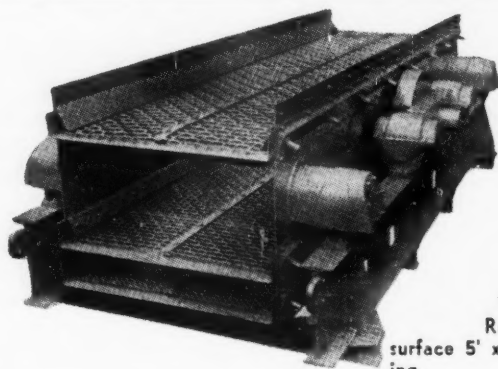
3090 W. Liberty Ave. Pittsburgh, Pa.

COMPLETE LIQUIDATION IMMEDIATE DELIVERY

*... Three and one-half million
dollars in new and nearly
new coal mining machinery
and equipment*



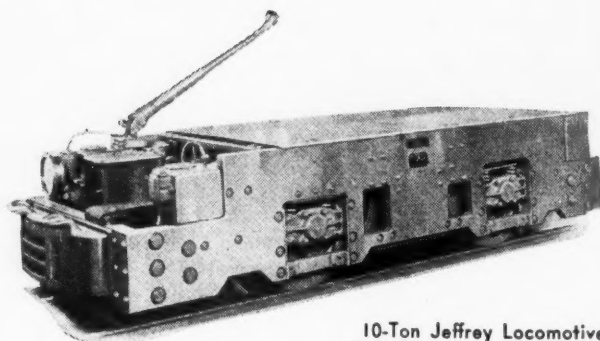
3-Ton
Jeffrey Locomotive
36" Gauge — Trolley Type



Type F-600 Ty-
Rock Screen 2—
surface 5' x 10' Full Float-
ing.



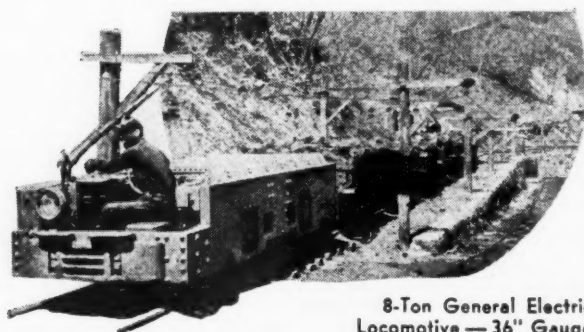
6-Ton Jeffrey Locomotive 36" Gauge — Trolley Type



10-Ton Jeffrey Locomotive
36" Gauge — Trolley Type



20-Ton Goodman Locomotive High Type — 36" Gauge



8-Ton General Electric
Locomotive — 36" Gauge

THE COLUMBINE MINE EQUIPMENT CO., INC.

FLAT IRON BUILDING, 1669 BROADWAY

DENVER 2, COLORADO

Subsidiary of Portland Equipment Co., 11 Broadway, New York 4, N. Y.

WRITE FOR OUR COMPLETE LIST OF MACHINERY AND EQUIPMENT
SEE PAGE 197 FOR APPROXIMATE SUMMARY OF HARD-TO-GET OFFERINGS

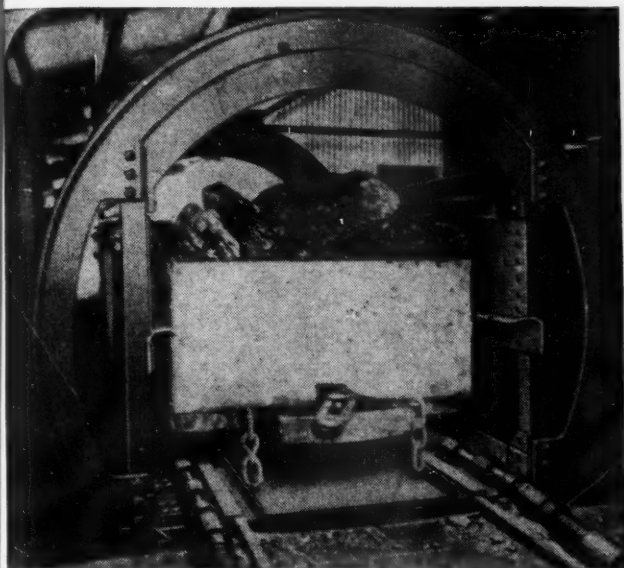
THE COLUMBINE MINE EQUIPMENT CO., INC.

1669 BROADWAY, DENVER 2, COLORADO

Subsidiary of Portland Equipment Co., 11 Broadway, New York 4, N. Y.

Complete Liquidation . . . Immediate Delivery

*... Three and one-half million
dollars in new and nearly
new coal mining machinery
and equipment*

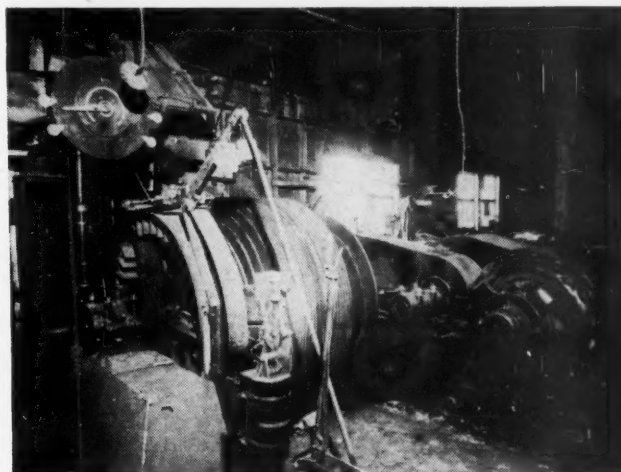


ROTARY CAR DUMPER
Fast Dumping of Coal Cars

HERE ARE SOME OF THE HARD-TO-GET OFFERINGS

HAULAGE MOTORS, trolley type locomotive—250 Volt D. C.—electrically driven, 36" gauge, General Electric, Westinghouse, Jeffrey and Goodman.
COAL MINING MACHINES—29 L-E "Arcwall" Jeffrey mining machines mounted on Joy electrically driven caterpillar trucks.
Goodman Shortwall No. 112 mining machines.
Goodman 36" Gauge TRUCKS, Type "M."
MINING MACHINE TRUCKS—Joy "T-I."
MOTOR GENERATOR SETS—2 sets 225 H.P. connected to Ridgeway 150 K.W. generators, with panelboards, A.C. and D.C. meters and transformers complete. 2 sets 300 H.P. connected to Ridgeway generators, 200 K.W., complete with panelboards, A.C. and D.C. meters and transformers. And others.
BATTERY CHARGING UNITS—Joy, Westinghouse, Hobart Bros. Co., Electric Products Co.
MOTORS—A.C. and D.C., all types, 1 H.P. to 300 H.P., starting compensators and switches.
TRANSFORMERS—General Electric, Westinghouse, 7½ KVA, 37½ KVA and 150 KVA.
BOX CAR LOADERS—Ottumwa—Manerre.
PUMPS—Geared and centrifugal—motor and belt driven—Gould, Demming, and Myers.
FANS—Jeffrey, American Blower, Sturdevant.
TIPPLE—3 track tippie consisting picking screens, grizzlies, car retarders, end dump, belt conveyors, elevator bucket conveyors, box car loaders complete.
VIBRATOR SCREENS—Ty-Rock Tyler F-600 2 surface 5'x10' Screen, full floating.
SHAKER SCREENS—"Marcus" shaker screens.
CONVEYORS—Flight conveyors, elevator conveyors.
COAL CRUSHERS.
RAILS—250 tons 30 lb., 200 tons 40 lb., 150 tons 50 lb., 150 tons 60 lb., 350 tons 65 lb., 200 tons 75 lb.
SPIKES, bolts, tie plates, frogs, switches, switch throws.
COPPER trolley wire—2/0, figure 8 and 4.0 round.
TROLLEY HARDWARE—Hangers, clamps, frogs, switches, roof hangers.
TRANSMISSION WIRE—Single conductor, 2 conductor, 3 conductor—Neoprene, glass, rubber insulated 2/0 to 500,000 CM.
JOY 7-BU. LOADERS—Caterpillar mounted with high pedestal.
SHUTTLE CARS—Joy 42D storage battery.
ELEVATOR CONVEYORS—Joy.
AIR COMPRESSORS.
MACHINE SHOP—Complete.
ELECTRIC SHOP—Complete.
CARDOX PLANT—Complete.
BATTERIES—Exide and Gould Ironclad, 24 cells.
\$150,000.00 WORTH of new parts, bearings, gears, bolts, nuts and screws for Joy, Jeffrey, Goodman, Ottumwa, Manerre, General Electric, Westinghouse, Demming, and other popular manufacturers' equipment.

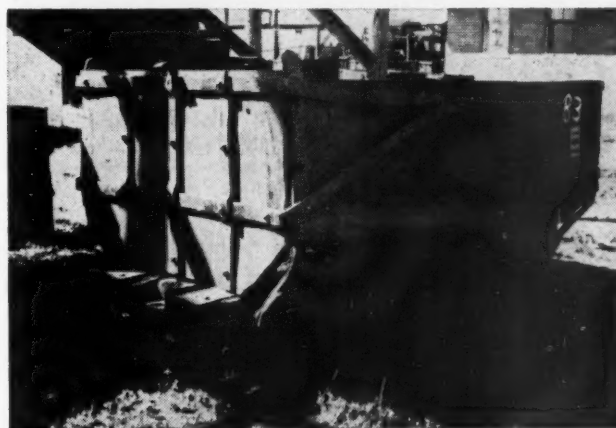
ALSO THOUSANDS OF ITEMS TOO NUMEROUS TO MENTION.



Cornical Drum Hoist, 300 HP, Drum 8'-6" Dia. x 72" wide



Phillip's Crossover Dump and Car Retarder



Tipple Car, 2 Ton, 36" Gauge

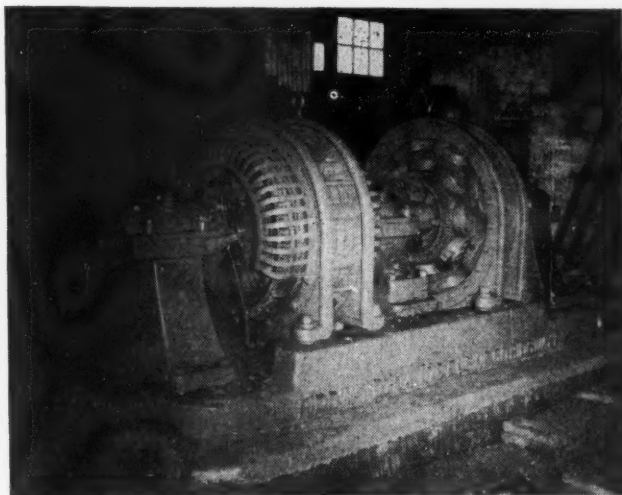
WRITE FOR OUR COMPLETE LIST OF MACHINERY AND EQUIPMENT

COMPLETE LIQUIDATION IMMEDIATE DELIVERY

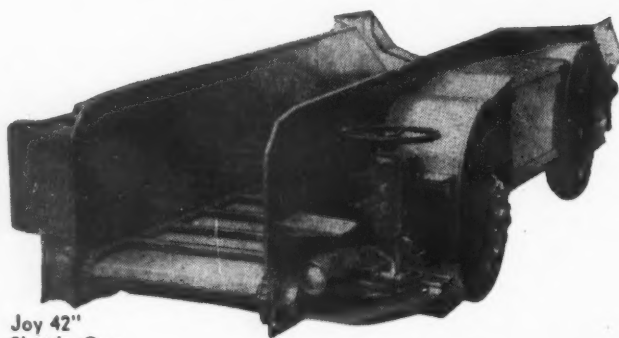
*... Three and one-half million
dollars in new and nearly
new coal mining machinery
and equipment*



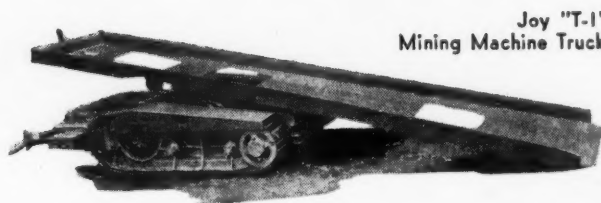
Jeffrey Arcwall 29 L-E Mining Machine



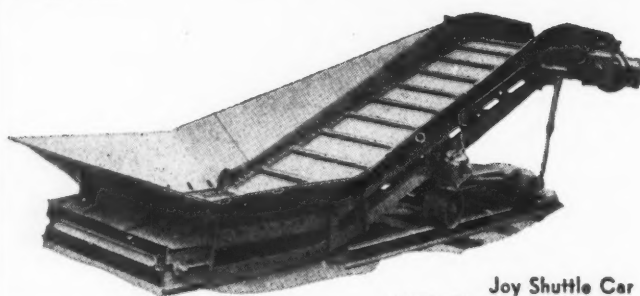
Motor-Generator Sets



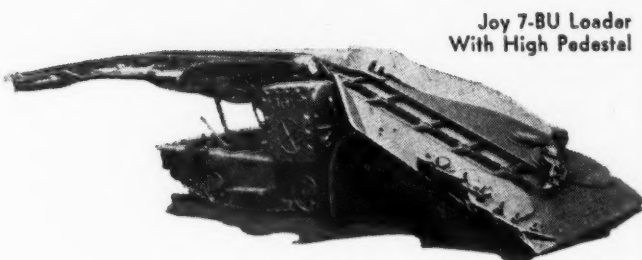
Joy 42"
Shuttle Car



Joy "T-1"
Mining Machine Truck



Joy Shuttle Car
With Elevating Conveyor



Joy 7-BU Loader
With High Pedestal

WRITE FOR OUR COMPLETE LIST
OF MACHINERY AND EQUIPMENT

*Subsidiary of
Portland Equipment Co.*

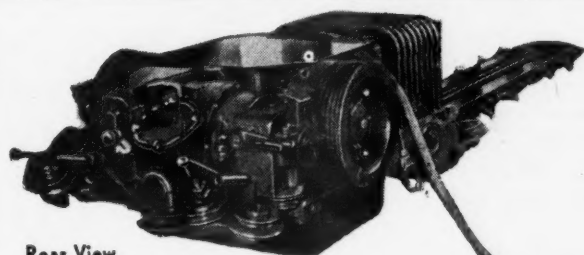
THE COLUMBINE MINE EQUIPMENT CO., INC.

11 Broadway, New York 4, N. Y. 1669 BROADWAY, DENVER 2, COLORADO

SEE PAGE 197 FOR APPROXIMATE SUMMARY OF HARD-TO-GET OFFERINGS

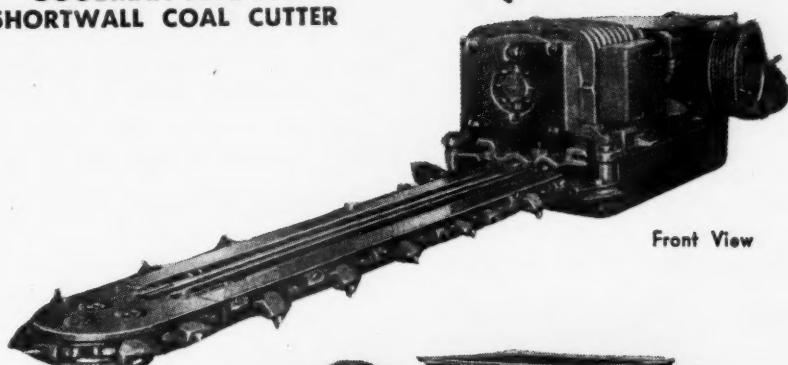
COMPLETE LIQUIDATION IMMEDIATE DELIVERY

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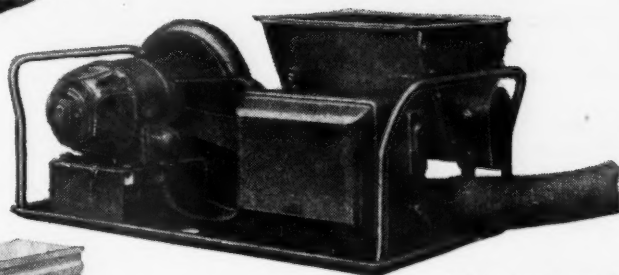


Rear View

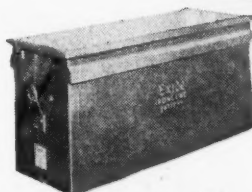
**GOODMAN TYPE 112
SHORTWALL COAL CUTTER**



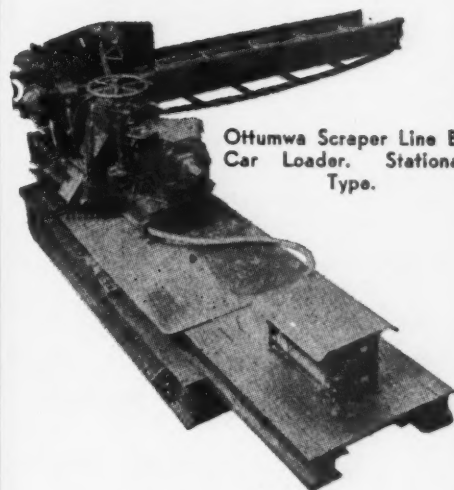
Front View



**Safety Appliance Co.
Rock Duster**



**Exide and Gould
Ironclad Batteries**



**Ottumwa Scraper Line Box
Car Loader. Stationary
Type.**



**Partial View of Tipple with Grizzlies and
Picking Screen.**



Complete Cardox Plant, 160 Shell Capacity

TIPPLE CARS, 2 Ton Capacity, 36" Gauge End Dump, Roller and Ball Bearing.

ROTARY CAR DUMPER for 36" Cars With Automatic Control.

HOISTS—I Double Drum Conical Hoist—Denver Engineering Works—300 HP., Silent Chain Drive, Complete With All Panelboards, Transformers and Controllers and Numerous Others.

THE COLUMBINE MINE EQUIPMENT CO., INC.

FLAT IRON BUILDING, 1669 BROADWAY

DENVER 2, COLORADO

Subsidiary of Portland Equipment Co., 11 Broadway, New York 4, N. Y.

SEE PAGE 197 FOR APPROXIMATE SUMMARY OF HARD-TO-GET OFFERINGS

PUBLIC AUCTION

MINING EQUIPMENT AND MACHINERY OF FORMER FALL BROOK COAL COMPANY

SALE DATE: November 18, 1947, commencing 10 A.M.

INSPECTION: Begins November 14, 1947, until sale.

2—Roberts & Schaeffer Airflow Coal Cleaners, New in 1943; complete with Air Ducts and Motors.

1—Penna. "Bradford" Coal Breaker and Cleaner, complete with dust casing and steel work, Heavy series.

1—Goodman Chain Conveyor, Type 91-C-12.

2—Wilmot Crusher Rolls, 24x50 in.

1—Schramm Air Compressor, 315 cu. ft.

1—105 cu. ft. Schramm Air Compressor, on steel wheels.

1—Permanco Horizontal Traction Drill, Model V-14, complete with attachments.

1—Federal Tractor-Trailer Unit.

1—Chev. 1942 Pickup Truck.

Quantity: Electric Motors, various sizes, AC and DC.

4—Centrifugal and Plunger Pumps.

4—Clarage Fans.

Office Equipment, Desks, Chairs, Adding Machines, Typewriters, etc.

2—Ventilating Fans, 1—Robinson, 1—Sturtevant.

3—Coal Shakers, various sizes and types.

1—Steel Rock Bin, 20-ton cap.

1—2-yd. Dragline Bucket and Boom.

1—½-yd. Bay City Gas Shovel

120 tons Mine Rails, first class condition, all sizes.

1—TD-40 International Bulldozer.

2—Goodman Mine Locomotives, 1—4-ton, 1—6-ton.

150 Mine Cars.

1—Ingersoll Rand Wagon Drill, with air hammers.

1—Sprague & Henwood Gas Engine Driven Diamond Core-Drilling Machine, misc. attachments.

1—Schramm Portable Floodlight, Wisconsin motor, 5 light units.

Lot Mine Car Wheels, Frames & Axles.

2—Fairbanks Platform Scales.

Machine Shop, completely equipped, Lathes, Jacks, Welders, Drills, Tools.

Complete Powerhouse, Engines, Generators, Boilers, Pumps, Panels, etc.

2—Mine Car Scales.

Laboratory Coal Test Equipment.

2—Delco 1,500 Watt Light Plants.

5—Conveyors, various types and sizes, with all attachments.

1—Cyclone Dust Collector.

1—Deister-Leahy Heavy Duty Vibrating Screen, 4'.

2—Shovel Buckets, 1—5-yd., 1—1½-yd.

BUILDINGS

1—Roberts & Schaeffer Tipple and Cleaning Plant, steel clad.

1—Lot, Misc. Frame Buildings.

1—Power plant, steel construction.

1—Office building (frame).

**ITEMS LOCATED ANTRIM, PA., TIOGA COUNTY, 9 MILES SOUTH OF WELLSBORO, PA.,
ON PENNA. HIGHWAY ROUTE 84.**

For Further Information

PHONE -- WRITE -- WIRE

SIDNEY A. SIMON, LIQUIDATING ATTORNEY, OR JOSEPH E. JOHNSON, AUCTIONEER

100 N. Main St., Jersey Shore, Pa.

Phone J. S. 660

225,000 Feet B. M. HEAVY TIMBERS

\$25.00 MBF

F.O.B. BUFFALO, N.Y.

Oak and Mixed Hardwoods — Sound and Thoroughly Seasoned

6"x8"x10' to 16'6"

7"x9"x10' to 16'6"

Total Count 4,381 pieces

WRITE PHONE

**MORRISON
RAILWAY SUPPLY CORP.**
1437 BAILEY AVENUE, BUFFALO 12, N. Y.
Telephone TAYlor 2400

SPECIAL OFFERING

Immediate Delivery

58—50-Ton, All Steel, Twin HOPPER CARS. 1,880 Cu. Ft. Capacity. Cast Steel Side Frames and Bolsters.

Good Condition.

PHONE WIRE WRITE

IRON & STEEL PRODUCTS, INC.

42 years' experience

13484 S. Brainard Ave., Chicago 33, Illinois

"ANYTHING containing IRON or STEEL"

LOCOMOTIVE

50-ton Vulcan gas-electric.

Standard gauge, American couplers.

Overhauled condition.

Very attractive price.

Description upon request.

THE INDUSTRIAL EQUIPMENT CORP.

(established 1902)

910 First National Bank Bldg.
Pittsburgh 22, Pa.

PRICES REDUCED

We have just reduced prices on all our coal mining equipment and have cut some items up to 25%. It will pay you to get in touch with us on your requirements and take advantage of these reductions.

COAL CUTTERS

6—Sullivan CE-7 AC Short Wall, complete with Standard and Tip-turn Trucks, most machines with Power Cable.

TROLLEY LOCOMOTIVES

4—4½ Ton Goodman Gathering Type, equipped with Power Reels and Crabs, 36" Gauge.
1—4½ Ton Jeffrey, with Crab Motor, 36" Gauge.
2—7½ Ton Goodmans, 36" Gauge.

MACHINE SHOP EQUIPMENT

1—24"x10' American Quick Change Lathe.
1—20"x8' Monarch Quick Change Lathe—Motorized.
2—Drill Presses 16" to 26".
1—200 Amp. Smith Welder—on wheels.
1—18" Gould & Eberhardt Shaper.
1—Cleveland Combination Punch & Shear, 26" Throat.
1—Power Hack Saw, B.D.
Bolt & Pipe Threaders, Chain Blocks, Swing Cranes with Crawls, Wood Planer, Saw Table, Hand Shears, etc.

COAL WASHERS

2—Rheolaveur Launderers, 60—80 Ton Capacity, complete with Header, Feed Pipes, Supporting Frame, Dividing Head, Sampler, 10'x12' Steel Bin, Flight Conveyors 30' to 170' Centers—Some with dewatering screens.

COAL CRUSHERS

2—30"x30" Jeffrey Single Roll.
1—36" St. Louis Ring Type.
1—24x20 Swing Hammer Mill.

JOY LOADERS

1—7-BU Joy Loader, Cat Mounted, Low Pedestal, 250 Volts DC, Overhauled and Guaranteed.

PUMPS

1—2" Marsh, V-Belted to 15 H.P. Motor 150 GPM, 160' Head.
2—Ingersoll-Rand Motor Mounted, 150 GPM, 400' Head.
2—10x10 Allis-Chalmers Centrifugal, 1500 GPM, 56' Head, direct connected to a 100 H.P., 2300 Volt Center Drive Motor.
5—5x5 Deming Oil-Rite Piston Pumps—Motorized.

RAILROAD SCALES

3—100 Ton Fairbanks, Steel I Beam Stringers, Inspected by W. W. & I. B. in April, 1947.

COKE EXTRACTORS

2—Coke Extractors, 250 Volts DC, Std. R. R. Gauge.

LARRY CARS

4—Connellsville Larry Cars, Trolley Operated, 6 Ton Capacity.

CONVEYORS

3—24" Belt Conveyors, 15' to 85' Centers, 2 equipped with Ding's Pulleys.
1—30" Belt Conveyor, 370' Centers.
1—30" Belt Conveyor, 70' Centers.
1—36" Belt Conveyor, 50' Centers.
1—28" Apron Conveyor, 21' centers. Flight Conveyors from 12" to 30" up to 170'.

RAILS

150 Tons—60# Relayers.
75 Tons—65# Relayers.

MINE FANS

1—8-H60 Aerodyne Exhausting Fan, with Air Locks, Hood, etc. with 75 H.P. Motor—Purchased new in 1942.

HOISTS

1—No. 22 Vulcan, with 40 H.P. Motor, Controller and Grids.
1—No. 22 Vulcan, with Man Cage, 30' Steel Head-frame and 40 H.P. Single Speed Elevator Type Motor, equipped with Solenoid Brake (Both Hoists purchased new in 1942 and 1944).
1—Single Drum Gasoline Hoist, direct connected to 2½x4¼ Wisc. Gas. Engine.

PIT CARS

160—Card Iron Works R. B. Pit Cars, 36" Ga.
1—Card Iron Works Rock Car, 90 Cu. Ft. Cap.

MINE LAMPS

188—Edison Model P Mine Lamps, with Charger and Racks.
5—Wolfe Safety Lamps.

MISCELLANEOUS

AC & DC Motors, new & used, from 2 H.P. to 75 H.P.
R.C. Stranded Copper Wire, 2/0—4/0 & 350,000 CMS.
Trolley Wire 2/0 & 4/0 Rd. & Fig. 8.
Trolley Hangers and Supplies, New and Used.
Wall Telephones, Jacks, \$20,000.00 worth of New Supplies.
New CE-7 Sullivan Coal Cutter Parts.
New and Used Wire Rope, ¾" to 1¼".
1,050' New 3-Cond. No. 6 All Rubber Power Cable.
1—3,000' Tramway, complete with buckets, etc.
1—750' Jig-back Tram, complete with motor.
Office Equipment, Electric Calculators, Typewriters, Desks, Filing Cabinets, etc.

WRITE FOR OUR COMPLETE INVENTORY
AND SAVE MONEY ON YOUR PURCHASES

FLORENCE

MACHINERY AND SUPPLY COMPANY

SUITE 904, EQUITABLE BUILDING

DENVER 2, COLORADO

C. J. Parish, Mgr.

Phone: Alpine 2803

Yards: Denver and Florence, Colo.

FOR SALE

LOCOMOTIVES—250 VOLT DC
 2—13-ton Westinghouse, type 908-C
 3—8-ton Westinghouse, type 908-B
 6—8-ton General Electric, type HM-839
 5—8-ton Goodman, type 32-1-4-T-2
 6—6-ton General Electric, type HM-801
 2—4-ton late type Goodman Gathering Locomotives, Serial Nos. 4926 and 4927, motors Type 142-04C, 250 volt, ball bearing, 1½" armorplate frame, equipped with Timken Bearing Journals and CY-21 floating type, motor driven reel with 300' of practically new cable, completely rebuilt and guaranteed.

CUTTING MACHINES—250 VOLT DC
 20—12-AA Goodman, 50 H.P.
 12—112-AA Goodman Universal, 50 H.P.
 5—112-CA Goodman Universal, 50 H.P.
 22—CE-7 Sullivan Tip-turn trucks
 3—Jeffrey late type 29-L Arcwall Machines
 3—Jeffrey 29-LE Arcwall Machines

LOADING MACHINES—250 VOLT DC
 5—L-400 Jeffrey 2—11-BU Joy
 2—260 Goodman 3—Myers-Whaley
 8—7-BU Joy

LOADING AND CUTTING MACHINES—220/440 VOLT AC
 8—7-BU Joy. Just taken out of service
 8—112-G3 Goodman Universal, tip-turn trucks, cable reel and cable

ELECTRIC HOISTS
 Several electric hoists from 150 to 1600 H.P. for shaft, drift, and slope mines.

STEEL TIPPLES AND MISCELLANEOUS
 We have several 3, 4 and 5-track steel tipples, complete with shaker screens, vibrating screens and all necessary appurtenances, suitable for shaft, slope, drift or strip mines.

1—Jeffrey 36" 6-ply Belt Conveyor, steel carrying frame, Timken Bearing carrying and return idlers, complete with motors and all necessary appurtenances, 1100' centers, used only a short time.



Frank J. Wolfe

We specialize in buying complete mines that are going out of business or from receivers in bankruptcy, administrators of estates, etc.

COAL MINE EQUIPMENT SALES CO.
 306-7 BEASLEY BUILDING L.D. PHONE-34 TERRE HAUTE, INDIANA

STRIPPING & MINING EQUIPMENT

Coal Crushers
 Conveyors
 Vibrating Screens
 Electric Generator Sets
 Electric Coal Drills
 Mine Fans

THE INDUSTRIAL EQUIPMENT CORP.
 (Established 1902)
 910 First National Bank Bldg.,
 Pittsburgh 22, Pa.
 Warehouse: Carnegie, Pa.

AIR COMPRESSORS:
 12—Belted 360, 676, 870, 1000, 1300 ft.
 12—Diesel 105, 315, 520, 676 & 1000 ft.
 6—Electric 1300, 1500, 2200, 3000 ft.

CARS & LOCOMOTIVES:
 100—50 ton cap. Gondolas.
 35—50 ton cap. Flat Cars.
 4—35 & 85 ton Diesel Locomotives.
 6—10, 16, 20 & 30 ton Gas Locomotives.
 150—8000 & 10000 gal. cap. Tank Cars.
 26—12 yd. Std. ga. Steel Dump Cars.
 1—50 ton G.E. Diesel Elec. Locomotive.

RUBBER CONVEYOR BELTS:
 1000', 60", 600' 30", 300', 20", 1000', 42", 900', 48", 1450', 36", 1200', 24", 900', 18", 600', 16", 350', 14".

ELECTRIC LOCOMOTIVES:
 15—3, 5, 8 ton Battery & Trolley.

DIESEL GENERATORS:
 12—100, 150, 180 & 480 K.W.

MINE LOADERS:
 17—GD9, Elmcot 21, Conway 20, 50, 80 & 75 and Sullivan HL3.

STEEL TANKS:
 6—50,000 and 100,000 gal. Tanks on tower.
 30—6000, 10,000 and 20,000 gallon capacity.

SHOVELS — DRAGLINES:
 7—1 yd., 1½ and 2 yd. Gas & Diesels.
 16 yd. Elec. 160 ft. Boom Dragline.

R. C. STANHOPE, INC.
 60 E. 42nd Street New York 17, N. Y.

HIGH GRADE TOOLS
 36" & 42" Bullard Boring Mills.
 100" Cincinnati Vertical Boring Mill.
 54" Bullard 'New Era' Turret Lathe.
 25 G & L Horizontal Boring Mill.
 45 G & L Horizontal Boring Mill.
 18"x10" Boye & Emmes Lathe.
 24"x14" Boye & Emmes Lathe.
 24"x14" L&S Grd Head Lathe.
 30"x25" Ctrs. American Grd Hd Lathe.
 2 & 3 Cincinnati Plain Millers.
 3B Milwaukee Plain Millers.
 2' to 5' American Plain Radial Drills.
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3—Goodman G 20 Shaker Conveyors with 250 v. 20 HP motors, also Goodman #3 Duck Bills.

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1—35B Jeff. Perm. 250 v. 6" Jeffrey Chain & Bar on revolving trucks.
4—35B Jeff. Perm. 500 v. 7½" Clin. Chain and Bar on revolving trucks.
2—12G3 Goodman AC 220/3/60 6' Bars.

STORAGE BATTERY LOCOMOTIVES
1—6 Ton G.E. permissible 36/44 Ga. HM 825 BB.
4 Ton 36" Ga. Atlas 2 BB Motors.
5½ Ton Type D Ironton. 42" Ga.
2—5½ Ton Ironton Type A. 36/42" Ga.

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13 Ton Westgh. 250 v. 36" or 40" Ga.
3—6-ton G.E. 250 v. HM 803 BB Motors. 36" Ga. O.S. Rolled Steel frame with flat top motor driven reel.
10 Ton Goodman 36B04T O.S. fr. 250 v. 36" Ga.

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18x24 and 18x30 New Scottsdale dbl. roll.
Rotary Con. & MG Sets (3 ph. 60 cy.)
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50 KW G.E. 125 v. 75 HP G.E. 2200 v. 440/220 v.
750 KW G.E. 550 v. 1100 HP Syn. 4600 v.
640 KW Al. Ch. 250 v.—800 HP Syn. 2300 v. (available 2 months.)
2—300 KW G.E. 275 v.—435 HP Syn. 440 v. (available 6 months.)
150 KW G.E. 275 v.—225 HP Syn. 2300/4000 v.
100 KW Ridg. 275 v.—150 HP 2300 v. Syn.
35 KW Cr. Wh. 250 v.—50 HP 220/440 v.
7½ KW Wooton 125 v. 10 HP. Wooton Vert.

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3—New 10 KW 125 v. 220/440/3/60.

DC MAGNETIC STARTERS
New 230 v. DC Magnetic Cutler Hammer. Starters. 25, 40, 50, 60, 75 & 100 HP.

SLIP RING & SQ. CG. MOTORS			
HP	Make	Speed	Wdg. Type
1400	West.	1200	Syn. New 1 P.F.
1000	West.	1200	Syn. New 8 P.F.
750	West.	1200	Syn. New 7 P.F.
600	West.	900	S.R. CW NEW
350	G. E.	900	S.R. 1-M
300	West.	1800	S.R. CW
250	West.	2:7	S.R. CW 1314
200	G. E.	240	S.R. MT 412
150	West.	720	S.R. CW
100	West.	1750	S.R. C-1
100	G. E.	500	M 1-25-cy.
75	G. E.	800	S.C. I K
60	G. E.	1100	S.C. KT343
50	West.	500	S.R. CW 638 D
50	G. E.	500	S.R. 1-M
50	West.	870	S.C. CS 638A

HOISTS, CRANES & PUMPS
400/500 HP Flory slope Fixed drum 6' dia. 5' face. 9" flanges—22000± rope pull.
400 HP Vulcan conical drum shaft Hoist.
1—50/75 HP 2 drum Meade Morrison slope.
75 HP Ottumwa slope with AC Motor.
75 HP Vulcan 2 drum shaft. S.R. Motor.
40 HP Lidgerwood sgl. ft. drum geared to A.C.
1—1 Ton AC Monorail 220/3/60.
2—Fairmont Car Retarders.
10 Ton Larry Car 500/250 v. DC.
10 HP Fridy Car Puller. AC Motor.
15 HP Ottumwa sgl. fr. dr.—15 HP. SK 230 v.
4—2720 GPM 85" Le Courtney Bronze fitted 10".
1—700 GPM 60" Wheeler Bronze Fitted 5" Cent.

625 GPM 12' Hd. De Laval 10 HP 230 v. DC.
300 GPM 36' Hd. DeLaval 1½ HP 230 v. DC.
300 GPM 44' Hd. DeLaval 10 HP. 230 v. DC.
150 GPM 53' Hd. De Laval 5 HP. 230 v. DC.

DC MOTORS GENERATORS. 230/250 v.			
HP	Make	Speed	Wdg. Type
1200KW	Al. Ch.	750	cpd. 500 v.
1500	West.	600	sh. 600 v.
175	G. E.	475	ser. MD 109
130	G. E.	550	ser. CO 1812
100	G. E.	480	ser. MD 108
60	West.	1750	sh. SK 120L
50	Northern	600	ser. K
50	West.	250/1000	sh. SK
50	Reliance	1750	cp. 166 T
40	G. E. (Vert.)	1750	cp. CD 93
40	Roth	1500	
35	C. Wh.	700	sh. CM
15	West.	800	cp. SK 93
15	Wh.	800	sh. CM
15 (4)	C. Wh.	1400/1700	sh. CM
13	West. (Enc.)	825	cp. SK 113
10 (2)	G. E.	1750	sh. CD
7½	G. E.	1750	sh. RL

AIR COMPRESSORS
1200 cu. ft. 100± Worthington 2 stage Belted.
750 CFM 100± Ch. Pa.—150 HP West. S. R.
1—373 cu. ft. 100± Bury-AC Motors.
173 cu. ft. 100± Pres. Chic. Pneu. Belted.
1—90 cu. ft. 100± Pres. Chic. Pneu. Belted.
1—75 cu. ft. 100± Chg. Pneu.-AC Motor.

AC MAGNETIC STARTERS (3 ph. 60 cy.)
200 HP G. E. Rev. Holst Control. 2200 V.
1—200 HP 440 v. Enc. reduced v. Comp.
1—150 HP. 440 v. Enc. reduced v. Comp.
7—150 HP. 440 v. Enc. across line switches.
1—125 HP. 440 v. Enc. reduced v. Comp.
7—75 HP. 220 v. Eng. across line switches.

ROTARY CONVERTERS

500 KW GE. SYN. 275 V., 6 Ph, 60 Cy., 1200 RPM. Pedestal Type. 2300 V. Transformer and Switchgear.

300 KW GE. SYN., 575 V., 6 Ph., 60 Cy., 1200 RPM. Pedestal Type. 2300/4000 V. Transformers and Switchgear.

MOTOR GENERATORS

500 KW GE. SYN., 575 V. 2300/4000 V., 3 Ph., 60 Cy., 900 RPM. Complete Manual Switchgear.

300 KW RIDGWAY SYN., 275 V., 2200 V., 3 Ph., 60 Cy., 1200 RPM. Complete Manual Switchgear.

150 KW GE. SYN. 275 V., 2300 V. 3 Ph., 60 Cy., 1200 RPM. Complete Manual Switchgear.

LOCOMOTIVES

10-T JEFFREY, 250 V., MH-110 Mts., 36-48" Ga.
10-T WEST., 500 V., 907-C Mts., 36"-44" Ga.
10-T WEST., 250 V., 907-C Mts., 36"-44" Ga.
8-T WEST., 250 V., 906-C Mts., 42"-48" Ga.
6-T G.E., 250 V., HM-701 Mts., 22"-32" Ga.
6-T WEST., 250 V., 903-B Mts., 22"-30" Ga.

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2200V 60 CYC. 3 PH.

1—50 H.P. G.E. KR 527, 1800 RPM.

1—50 H.P. G.E. MT slipring, 695 RPM.

1—60 H.P. G.E. West. CS SB 1800 RPM.

1—100 H.P. G.E. KT 1800 RPM.

1—100 H.P. G.E. I-K 1800 RPM.

220 or 440V.

1—7½ H.P. G.E. MT952, 1160 RPM. SB 440V.

1—7½ H.P. G.E. MT 760, 1800 RPM.

1—7½ H.P. G.E. MT 900 RPM.

1—15 H.P. West. CW 900 RPM.

1—20 H.P. G.E. MT 512, 1200 RPM.

1—30 H.P. West. CI 638, 900 RPM.

1—30 H.P. West. CI 960 RPM.

1—30 H.P. West. CW 900 RPM.

1—35 H.P. G.E. ITC 5012 1200 RPM.

1—35 H.P. West. GH 652-D 690 RPM.

1—50 H.P. West. CW 690 RPM.

1—150 H.P. G.E. IM 600 RPM.

1—150 H.P. G.E. KTP 1800 RPM.

1—50 KW West. MG set, 125 V. 1150 RPM. compound wound, complete with charging panels.

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SHOVELS - DRAGLINES - TRACTORS - DRILLS

Model 1201 Lima Standard Shovel. 32' 6" boom, 22' stick, 3 1/2 yard dipper, Cummins Type L Engine. Excellent Condition.

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Model 1201 Lima Combination High Lift Shovel and Dragline. 42' boom, 32' stick, 2 1/2 yard dipper, 85' dragline boom, 3 yard bucket.

Model 1001 Lima Combination Shovel and Dragline. 34' 6" boom, 27' stick, 2 1/2 yard bucket, Waukesha-Hesselman engine, 80' dragline boom.

Model 1001 Combination High Lift Lima Shovel and Dragline. 36' 6" boom, 27' stick, 2 1/2 yard dipper, 80' dragline boom, 2 1/2 yard bucket.

95 Lorain Dragline. Waukesha-Hesselman diesel engine, 75' boom, 2 1/2 yard bucket. 580 Link-Belt Dragline. 80' boom, 2 1/2 yard bucket, D17000 Caterpillar engine.

K-48 Link-Belt Dragline. 75' boom, 2 1/2 yard bucket, D17000 Caterpillar engine Kohler light plant.

855-B P&H Diesel Shovel. 26' boom, 16' stick, 2 yard dipper.

44-B Bucyrus-Erie Combination Shovel and Dragline. Standard shovel front, 75' dragline boom, 2 yard bucket, Kohler light plant.

78-D Northwest Shovel and Dragline. 60' boom, 2 yard bucket, Murphy diesel engine.

855 P&H Shovel. 2 yard bucket, GMC diesel engine, standard front.

K-480 Link-Belt Dragline. 75' boom, 2 yard bucket, Waukesha-Hesselman engine. Very good condition.

Model 750 P&H 2 yard Combination Diesel Shovel and Dragline.

43-B Bucyrus-Erie Diesel Shovel. 1 1/2 yard dipper, 6 cylinder Buda diesel engine.

Model 77 Lorain. 1 1/2 yard dipper, D13000 Caterpillar engine. Recently overhauled.

Model 602 Lima 1 1/2 yard Combination Diesel Shovel and Dragline.

Model 362 Marion. Standard shovel front, 1 1/2 yard dipper, D13000 Caterpillar diesel engine. Completely rebuilt.

34-B Bucyrus-Erie. 1 1/2 yard dipper, D13000 Caterpillar engine.

Model 705 Osgood. 1 1/2 yard shovel front, 60' crane boom, 1 yard drag bucket, D11000 Caterpillar diesel engine.

34-B Bucyrus-Erie Combination Front Shovel and Clamshell. 50' clamshell boom, 1 1/2 yard dipper, D13000 Caterpillar engine.

105 Northwest Combination Shovel and Crane. 24' boom, 17 1/2' stick, 1 yard dipper, 35' crane boom, Twin City 4 cylinder gas engine.

105 Northwest Shovel. 24' boom, 22' stick, 7/8 yard dipper, Twin City gas engine.

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P&H Model 150 1/2 yard Dragline. Ford V-8 100 h.p. engine, 30' boom. Completely rebuilt.

Model 44 Loomis Clipper Blast Hole Drill with new Hercules engine.

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Marlow 8" diesel pump. Capacity 125,000 gallons per hour. 50' suction hose, 200' discharge hose. Used only 100 hours.

315 cu. ft. Gardner Denver Caterpillar diesel compressor on steel wheels with Wagon Drill. Outfit used 48 hours.

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315 cu. ft. Jaeger International diesel compressor with Wagon drill. 4 months old.

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1—Loaded Mine Car Haul for pulling cars on dump, 30 ft. long with AC motor.

1—Empty Car Haul for pulling empty cars away from dump, 50 ft. long with AC motor.

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1—29C or 29B Jeffrey Machine on Joy Caterpillars.

1—29C Jeffrey Machine with revolving head.

Sullivan Bit Sharpeners.

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80 ton American 6 wheel steam switchers. New 1944.

65 ton GE diesel electric. New 1942.

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8 ton Plymouth gasoline. New 1943.

4 wheel. New condition.

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One Goodman MS 7 1/2 Trolley Locomotive... \$1000.00

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above 250 volt 36" gauge.

Two 90° Angle Troughs with fulcrum jacks for Goodman size 3 Pan Line.

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6—112 AA Goodman 250 Volts

1—112 G3A Goodman 220 Volts

2—12 A and 12 AB Goodman 250 Volts

4—CE 7 Sullivan AC and DC

LOCOMOTIVES

1—8 ton Goodman 250 Volts 36" Gauge

4—8 ton GE 250 Volts 36" gauge

1—6 ton GE Trolley and Battery combination

2—6 ton Goodman type 2600 250 Volts

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2—7 BU Jays 250 Volts 42" gauge

4—5 BU Jays 250 Volts 42" gauge

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REBUILT EQUIPMENT — READY TO SHIP

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(Motors 220/440/ or 2200 v., 3 ph., 60 cy.)

No.	KW	Make	Speed
1	200	G. E.	1200
2	150	Allis-Chal.	1200
1	150	Ridgway	900
2	150	Star	1200
1	125	Star	1200
1	100	G. E.	600
1	100	G. E.	1200
1	100	Star	1200
2	75	West.	1800
1	50	West.	900
1	60	West.	900
2	40	West.	900
1	30	West.	1750
1	25	West.	1200
1	20	G. E.	900

D.C. GENERATORS—250 Volts—D.C.

No.	KW.	Make	Speed
10	10	West.	1150
11	15	West.	1400
3	15	West.	1150
2	20	West.	1400
3	20	West.	1150
5	25	West.	1400
4	25	West.	1150
3	40	West.	850
5	50	Louis Allis	1150
4	75	Star	1150
5	100	Star	1200
3	125	Star	1150

AC GENERATORS—2200/4000/440/220 V.

1—110 KVA Allis Chal., 277 rpm.
1—450 KW. Elec. Mach., 120 rpm.
1—1250 KW. West. 80% P.F., 1200 rpm.

D.C. MOTORS—250 Volts

No.	H.P.	Make	RPM	Type
1	175	G. E.	450	MD
5	150	Star	1800	F-92
5	125	Star	1150	
1	125	West.	1400	S-10
4	125	West.	1800	F-9
1	100	West.	700	S-12
4	100	Star	1800	
1	80	West.	450	
1	75	West.	575	SK-183
2	55	West.	650	SK-121
2	40	West.	625	MC-6f
3	40	Cr. Wheel.	1700	CM
1	40	West.	625	MC
1	40	West.	775	SK-140
1	35	G. E.	700	DLC
1	30	G. E.	530	LC
1	30	West.	700	S
1	30	C. Wh.	1750	CMC
1	30	Allis-Chal.	950	
1	25	West.	600	SK-136
1	25	West.	600	SK-113
6	25	West.	825	SK-120
5	25	West.	1150	SK
1	25	West.	1750	SK-83

3	20	Reliance	850	131
6	20	West.	975	S
3	20	West.	900	SK1001
5	20	West.	1150	SK-93
3	20	West.	1750	SK-83
10 new	20	Delco	1800	ball-br
2	20	G. E.	3600	CD
3	15	West.	560	S-7
2	15	West.	900	SK
12	15	West.	1150	SK-83
24	15	Delco	1800	
15	10	West.	850	SK-83
6	10	West.	1150	SK-63
4	10	West.	1750	SK-43

230 V. D.C. MAGNETIC STARTERS AND CONTROLLERS

- 456—New 1 HP. Cutler Hammer across the line.
- 111—New 1 HP. Cutler Hammer across the line.
- 30—New 2 HP. Cutler Hammer across the line.
- 55—New 5 HP. Cutler Hammer drip proof, 2 step current limit OL and LV.
- 58—New 7½ HP. Cutler Hammer.
- 60—10 HP. Cutler Hammer Magnetic.
- 12—10/15 HP., 230 V. Westinghouse Magnetic Drip Proof Controllers, 2 steps acceleration thermal overload relay with stop, start and reset buttons.
- 9—New 10/15 HP., 230 v. G.E.
- 10—New 20/35 HP., 230 v. Ward Leonard Magnetic.
- 10—New 40 HP., 230 v. G.E. Magnetic.

A.C. MOTORS—4000/2200/220/440 V.—3-Ph., 60 Cy.

No.	HP.	Make	Rpm.	Type
1	500	Elec. Mach.	120	Syn.
1	750	West.	1200	Syn.
1	1000	West.	1200	Syn.

DUST COLLECTING UNITS

- 2—Portable self-contained electric motors, 220/440 v., 3 ph., 60 cy. ¼ HP. single inlet and outlet.
- 12,000 CFM AMERICAN BLOWER FANS
- 4—NEW Centrifugal Fans, dir. con. to 12½ HP., 2 speed, A.C. or D.C. Motors.

CONVEYORS

- 3—G-20 Goodman Shaker Conveyors each with a Goodman Duck Bill complete with motor equipment with 250 v. DC motors.

PUMPS—Equipped With AC or DC Motors

- 1—11 GPM 460 ft. head Worthington Oil.
- 1—60 GPM 479 ft. head Gould Pump.
- 1—100 GPM 50 ft. head Dayton Dowd.
- 1—130 GPM 50 ft. head Dayton Dowd.
- 1—160 GPM 50 ft. head Dayton Dowd.
- 1—195 GPM 200 ft. head National Transit.
- 1—210 GPM 60 ft. head National Transit.

- 1—220 GPM 231 ft. head ¾"x3" Blackmer.
- 2—243 GPM 100 ft. head Dayton Dowd.
- 1—300 GPM 90 ft. head Dayton Dowd.
- 2—300 GPM 20 ft. head Gardner-Denver.
- 3—378 GPM 44 ft. head Dayton Dowd.
- 1—450 GPM 104 ft. head Dayton Dowd.
- 1—500 GPM Morris Machine Wks. 4" suc., 4" dis., 123 ft. head, 1760 rpm.
- 1—550 GPM 88 ft. head Dayton Dowd.
- 3—750 GPM 70 ft. head Dayton Dowd.
- 1—4000 GPM 138 ft. head Ingersoll Rand.

HOISTS or WINCHES

- 200—1½-ton Hand Cranked ratchet 27:1 thru an enclosed double reduction gear unit with 4 planetary gears mounted on steel plate complete with 48' of ¼" cable, ratchet type brake, push button release.

CAR PULLERS

- 100—Brand New with ¼" cable, 1½ and 2 ton A.C. or D.C. Motors.

FIRE PUMPS

- 3—1,000 GPM Worthington, 150# delivery pres. head or test pres. 225 lbs., dir. con. 133 HP., 875/1750 rpm., 230 V. D.C. G.E. Motors and controllers.

COMPRESSORS

- 1—315 CFM. Ingersoll Rand Portable, 100 lbs. pres., driven by 105 HP. Waukesha Oil Engines. 860 rpm.

STORAGE BATTERY LOCOMOTIVE

- 1—40-ton Goodman type M with Edison 63-G-18 battery with 2 motors, 11 hp., 80 v. with double reduction gear, speed 3½ MPH, 2,000 lbs. draw bar pull. Spare set of batteries and battery box, also spare parts.

ENGINE GENERATOR SETS

- 6—New 1 kw., Homelite portable, 14.25 Gas
- 3—New 1½ kw., Homelite, 115 v. 1 ph. 60 cy. portable Gas
- 3—1½ kw., Homelite, 14.25 v. D.C., portable Gas
- 6—2 kw. NEW Homelite, 28.5 v. D.C. Gas
- 1—5 kw., Engborg, 230 v. D.C. Steam
- 3—5 kva., 120/240 v. 1 ph. 60 cy. dir. con. to 6 HP. Witte DIESEL
- 1—7½ kw., 120/240 v. 1 ph. 60 cy. Master dir. con. Wisconsin air-cooled Gas Eng.
- 2—10 kw., 120 v. D.C. 1200 rpm., dir. con. to Hercules Diesel
- 3—New 25 kw. 120/208 v. 3 ph. 60 cy. Westinghouse dir. con. to 4 cyl. 70 HP. Lerol Gas Engine
- 2—25 kw., O'nan Gas Engines, 220/440 v. 3 ph. 60 cy.
- 2—30 kw., G.E. 125 v. Buda DIESEL
- 2—30 kw., 230 v. D.C. Buda DIESEL
- 1—35 kw., Ridgway 220/3/60 Steam
- 2—30 kw., 110/220 v. 60 cy. 1200 rpm Rogers DIESEL
- 1—125 kva., 220 v. 3 ph. 60 cy. Erie Ball STEAM

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36"	6	1/8"	1/16"	20"	4	1/8"	1/32"
30"	6	1/8"	1/16"	18"	4	1/8"	1/32"
30"	5	1/8"	1/16"	16"	4	1/8"	1/32"
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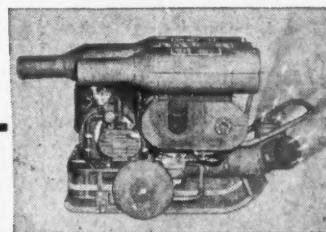
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- 1—124 E. J. Goodman Slabbing, 250 V., D.C.
- 1—36B Jeffrey Longwall, 250 V., D.C.
- 1—36B Jeffrey Longwall, 250 V., D.C.
- 1—12G3 Goodman Shortwall, A.C.
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LOCOMOTIVES

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- 1—Allis-Chalmers 20 HP, 110V, 1000 rpm.
- 1—Allis-Chalmers Starter and Switch for above motor.
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 1—9 KW. G.E. CD. 250 VDC., dir. con. 15-HP. G.E. Sq. Cg. Motor, 220/440-V., 3-Ph., 60 Cy., 1800-RPM.
 1—50 KW. Louis-Alis. 124/240-VDC., dir. con. 75-HP. Sq. Cg. Motor, 220/440-V., 3-Ph., 60-Cy., 1200-RPM.
 1—3-Unit G.E. (2) 27½ KW. CD generators, 275-VDC., 1750-RPM., dir. con. 100-HP. Sq. Cg. Motor, 220/440-V., 3-Ph., 60-Cy.
 2—(NEW) G.E. 94 KW. 62½-VDC., Type CD generators, dir. con. 135-HP. Sq. Cg. Motor, 220/440-V., 3-Ph., 60-Cy., 1200-RPM., generator and motor B.B. splash-proof.
 1—100 KW. Al. Chal. 125VDC. generator, dir. con. 150-HP. syn. motor, 2300-V., 3-Ph., 60-Cy., 900-RPM.
 Will furnish any of above complete with D.C. panels and A.C. control.

SYNCHRONOUS MOTORS
3-Ph., 60-Cy.

Qu.	Hp.	Make	Voltage	Speed
1	30	Whse.	220	1800
2	50	G.E.	2200	600
1	60	G.E.	440	1200
1	100	G.E.	440	900
1	100	Whse.	2200	1200
1	150	G.E.	440	900
1	150	G.E.	2200	900
1	150	G.E.	2200	1200
1	187	Elec. Mch.	440	900
1	500	G.E.	2200	720

Those among the above that do not have dir. con. exciter we will furnish with separate exciter sets, and can supply any of these motors complete with control.

SLIP RING MOTORS
CONSTANT DUTY

Qu.	Hp.	Make	Type	Volts	Rpm.
1	10	G.E.	I-M	220	1120
2	15	G.E.	I-M	220	1200

1	20	G.E.	MT-326	220	900
1	25	Al. Ch.	ANY	2200	800
2	25	G.E.	MT-326	2200	850
1	30	Whse.	CW	440	1750
1	30	Al. Ch.	ANY	440	900
1	30	Whse.	CW	440	1160
1	40	Al. Ch.	ANY	2200	433
3	40	G.E.	MT	550	560
3	40	G.E.	I-M	600	1170
1	50	Al. Ch.	ANY	2200	490
1	75	G.E.	MT 548	440	1200
1	75	Al. Ch.	ANY	440	1750
1	125	G.E.	I-M	440	435
2	125	G.E.	MT	2200	900
2	150	G.E.	I-M	550	385
1	150	Whse.	CW	2300	1160
1	200	C.W.	127AQ	440	500
1	250	Whse.	CW	2200	450
1	300	Al. Ch.	ANY	2200	511
1	300	G.E.	I-M	2200	1200
1	350	Al. Ch.	ANY	2200	511
1	300	G.E.	I-M	440	800
1	400	Whse.	CW-1108	2300	500
1	1150	Al. Ch.	ANY	2200	600
1	1200	Whse.	CW	2300	600

*—40-cycle.
 **—Heavy duty mill design.

TRANSFORMERS				
OIL-COOLED				
Qu.	K.V.A.	Make	Voltage	Ph. Cy.
3	25	G.E.	1100/ 2200/ 608	1 40
3*	37 1/2	Whse.	480/2300/2300/115	1 60
3	50	Whse.	2300/ 440/ 220	1 60
2	50	Wag.	13200/11880/ 575/287	1 60
3	130	G.E.	19000/ 9500/ 550/2200	1 60
6 165/247		G.E.	38100/22000/ 11000/430/215	1 60
1	200	Whse.	3810/2300/ 440	3 60
3	200	G.E.	2400/4550-Y	1 60
6	300	Whse.	2400/ 480/ 240	1 60

SQUIRREL CAGE MOTORS

3-PHASE, 60-CYCLE

Qu.	Hp.	Make	Type	Volts	R.P.M.
7	10	Whse.	C.S.	440	575
1	10	G.E.	HT-753	440	850
1	10	G.E.	E. R.	440	1090
1	10	G.E.	K-324	208	1750
1	10	Al.-Ch.	X	220	1750
1	15	G.E.	M.T.	440	900
1	15	G.E.	N.P.	440	1160
1	15	G.E.	K.T.	410	3500
1	20	G.E.	X.K.	220	865
1	25	G.E.	F.T.H.	220	575
3	125	Al.-Ch.	K.T.	220	900
1	125	Al.-Ch.	C.S.	220	1100
1	25	Whse.	I.M.	2200	1200
1	35	G.E.	N	220	560
1	40	F.M.	A.H.	440	860
2	40	Al.-Ch.	B	220	1150
2	40	F.M.	K.T.	220	1800
1	40	C.W.	C3 650	220	1760
1	40	Whse.	N.E.	440	695
1	50	G.E.	C.S.	220	9 0
4	50	Whse.	K.T.	440	1100
1	50	G.E.	A.T.	440	1750
1	50	Ideal	FTR	440	720
1	75	Al.-Ch.	A.H.	2200	1750
3	75	Al.-Ch.	E.K.	2300	685
2	100	G.E.	CN 761	410	1750
1	125	Whse.	A.R.	2200	1750
3	125	Al.-Ch.	ARW	2200	1750
1	150	G.E.	I.K.	220	675
1	150	G.E.	I.E.	550	720
1	150	Whse.	C.S.	440	1200
1	200	G.E.	T.K.	2300	490
1	200	Al.-Ch.	A.B.	2200	8550
1	250	Whse.	C.S.	2200	1160

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 Of Coal Age, published monthly at Chicago, Illinois, for Oct. 1, 1947.
 State of New York } ss.
 County of New York }
 Before me a Notary Public in and for the State and county aforesaid, personally appeared J. A. Gerardi, who, having been duly sworn according to law, deposes and says that he is the Secretary of the McGraw-Hill Publishing Company, Inc., publishers of Coal Age, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily, weekly, semiweekly or triweekly newspaper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the acts of March 3, 1933, and July 2, 1946 (section 537, Postal Laws and Regulations), printed on the reverse of this form to-wit:

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- 7 Goodman 112CA Shortwall Cutting Machines 6½' to 7½' cutter bars, power take-offs, rebuilt at Goodman shops, 250 Volts, D.C. 50 HP Universal. FLAMEPROOF
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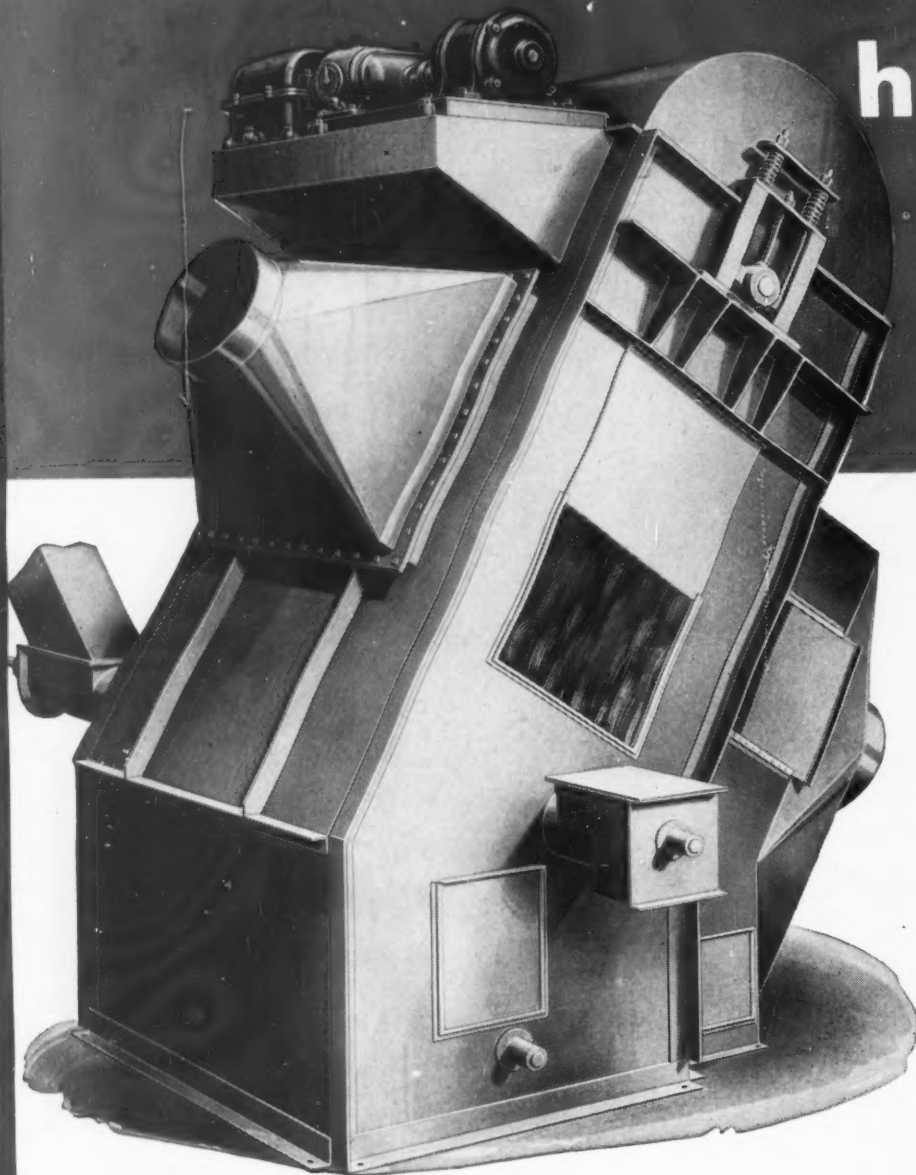
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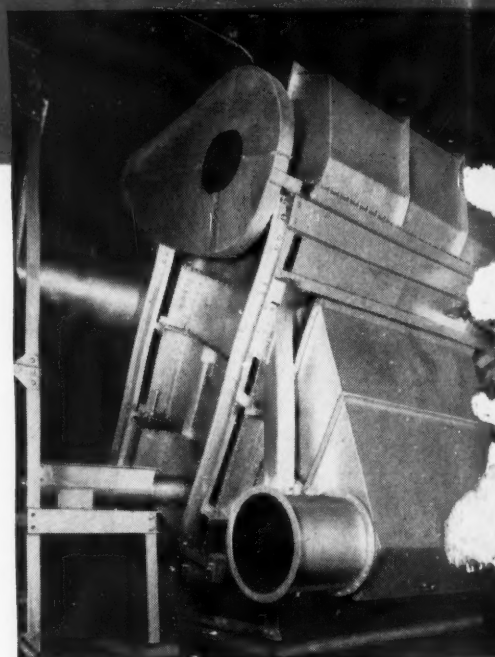


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